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AUGUST 1986

VOLUME 4
NUMBER 8

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Owners Talk About Their
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Music Software
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BARRY MANILOW

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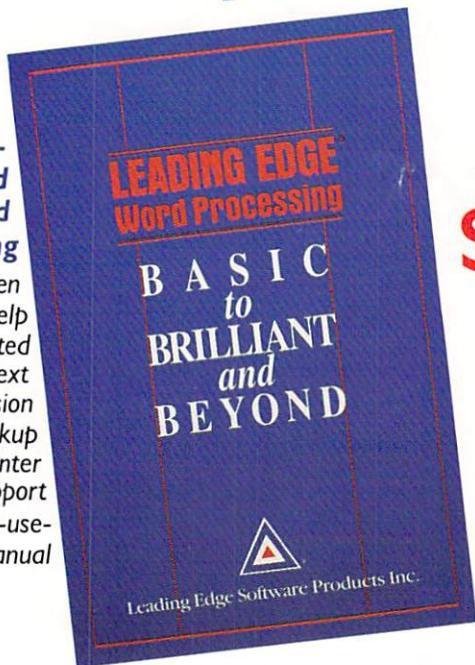


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NEXT MONTH: WRITING WITH COMPUTERS, PART II: WORD PROCESSING ADD-ONS

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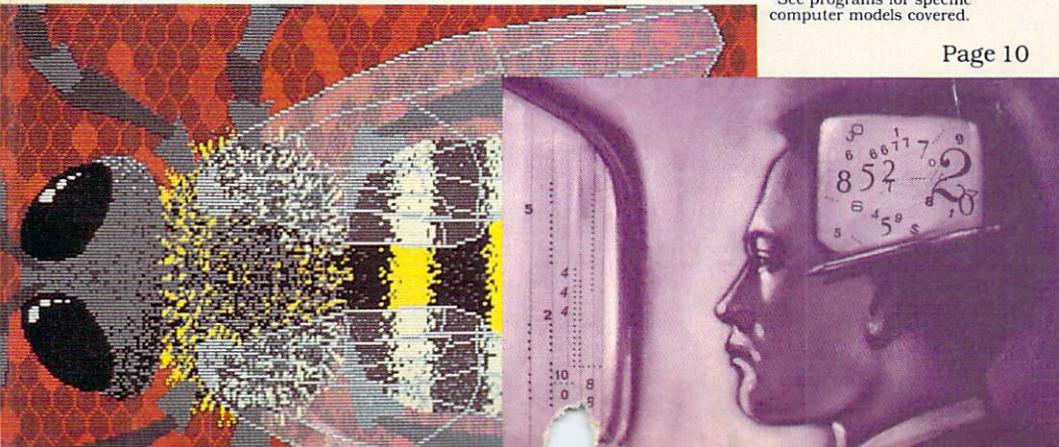
Game strategies, tips, tricks, hints, and original programs in a mini-magazine for the "computer generation."

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At-a-glance reviews, machine availability, and ratings for 24 new and noteworthy programs.

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EDITOR'S NOTE

I WON'T GO BACK!

M.R. Robinson (Robbie), who in 1920 founded Scholastic, the company that publishes FAMILY COMPUTING, had long been romanticized as a "sweet old man" by the time I was hired 11 years ago. It was he who greeted me on my first day, sizing me up with steely blue eyes and making me feel that he was wondering how "this one's going to turn out." It's been four years now since Robbie died, but I still hear his words and feel the bite of someone who knew what he was doing and wasn't willing to suffer fools.

Robbie comes to mind now, as I write this editor's note, because in my original draft I began to tell about my first experience with a computer "just a few short years ago." There was Robbie and the memory of hearing about his treatment of an editor who wrote about something happening a certain number of "short years ago." In the margin of the manuscript in question, Robbie is reported to have asked, "Just how long are those short years of yours? Two hundred and sixty-five days?"

Having felt Robbie glance with scorn upon my words, I merely pressed the delete key and my embarrassment was gone! In fact, it didn't take many presses of that key to bring me back to the beginning of the "page" and the opportunity to share with you the warm memory of a man I respected and admired and yes, somewhat feared.

Robbie would have liked seeing us all at our computers. Even though he undoubtedly would have hung on to his standard Royal typewriter, this man born in 1895 would certainly have tried his hand at word processing and he always wanted his company to be up-to-date. Robbie would have been especially appreciative of the ease with which an editor or writer could keep cutting and tightening copy, without wasting a lot of good paper.

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When thinking about Robbie, it's an easy leap to longing for the "good old days," for simpler times, but many new things really are better. For example, who can imagine writing with a paper and pencil any more. Not I, I'll never go back!

And apparently neither will our readers. According to an early look at the results of our latest reader survey, 64% of you already own word processing software.

It is because of the popularity of word processing that we are undertaking a major series on the subject, starting with this issue. This month we match needs to programs, and from then on, it's getting more from the package you've chosen. Next month we'll feature word processing add-ons that deliver additional features, such as a spelling checker or thesaurus, to the user. And for the next seven months we'll help you better utilize the standard features of your program. If you're like most people, you may not have progressed beyond the basics, thereby wasting much of the power of your software.

Robbie wouldn't have liked that.

Claudia Cohl

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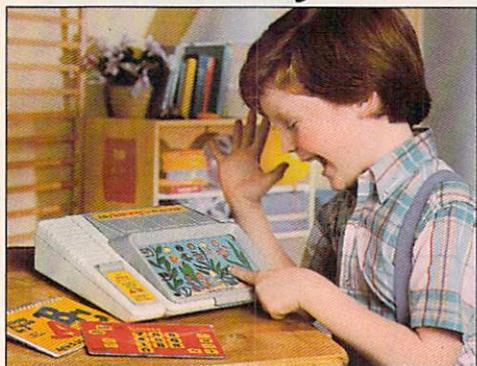


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*Clock sold separately.

CIRCLE READER SERVICE 8

LETTERS

COMPUTERIZING A BUSINESS

We have a secretarial and employment agency called Secretaries Unlimited. Our business is approximately 1½ years old now, and we have been trying to get financing for a 10 Mb IBM XT. We currently use a Commodore 64.

FAMILY COMPUTING has been very informative and helpful in starting our business. It has helped us choose the software (writing, planning, spell checking and home finance programs) and hardware (disk drives, Okidata 192 printer, and KoalaPad) to use our C64 to its fullest. We are going to continue to subscribe for years to come!

MARK AND SHERRI SMITH
Bellingham, Washington

WAIT! THE NEW 128'S GREAT!

I have long been a happy Commodore 64 user, but now I am looking forward to purchasing the new 128. After reading the "Buyer's Guide to Personal Computers" (June 1986), and specifically the review of the 128, I was greatly displeased.

You did mention the CP/M mode, one of the 128's most powerful features, but it can do a lot more than "run some old CP/M software," as you stated.

I believe you also made a mistake in saying that Commodore has failed to introduce the long-awaited *Jane* program.

Commodore has made the 128 compatible with some of the best software available, and a lot of it is even in the public domain.

BRICE REMAIEV
Emmaus, Pennsylvania

FLIPPING OVER PRINTMASTER

This quote from "Soup Up Your Software" in the June issue of FAMILY COMPUTING really caught my attention: "Apple users can load images from the flipside of the IBM-version PrintMaster Art Gallery disk into their edition of *The Print Shop*."

Does this mean that if I want to load images from *PrintMaster* into my Apple IIc computer and my Apple II version of *The Print Shop* program, I should buy the IBM version of the *PrintMaster* program?

Other than being confused by this one sentence, I really enjoy FAMILY COMPUTING! Thank you for a great magazine.

CHRISTOPHER T. CONNELL
Brick, New Jersey

Editor's Note: Both the IBM and Apple versions of The PrintMaster Art Gallery clip-art are on one disk. The IBM side of the clip art works with PrintMaster, and the Apple side works with The Print Shop. Sorry for the confusion.

GETTING WITH THE PROGRAM

I have been reading your magazine for over a year now, and I appreciate the reviews, adventure game hints, articles, and short programs. However, I can rarely find time to type in the long programs in the Programmer section. It seems the two pages spent just explaining some of the programs and the several pages of program listings could be spent more wisely for some other, more broad purpose.

EDWARD WATERS
Delmar, New York

After several months of trying to do without FAMILY COMPUTING, I have decided to renew my subscription. I find that I look forward with pleasure to receiving the useful and interesting programs and programming tips in each month's issue. I also generally enjoy keeping current on the developments in microcomputing.

JEFFREY D. HOEPPER
Jonesboro, Arkansas

SEARCHING FOR COCO PROGRAMS

I am a new subscriber to your magazine. The absolute wealth of programs of all types for various computers is truly amazing. I have recently purchased a Tandy Color Computer. Of course, after reading some of the reviews of gaming software in your magazine, I was excited about getting some for myself. Unfortunately, every software house that I contacted seemed to treat me like some kind of eccentric hermit. Is this because the Color Computer is somewhere out in left field regard-

Upcoming Features in FAMILY COMPUTING

Announcing:
FAMILY COMPUTING's Family of the Year Contest
Winners

Guide to Writing with Computers, Part II: Word-Processing Add-Ons

Back-to-School Computing Special

Entertainment: What You Can Learn by Having Fun

New Hardware Announcements

PLUS: Original Word Puzzle, Music and Game Programs

September Issue On Sale at Your Newsstand
August 19

ing hardware or software?

Should I consider my purchase as just a learning experience and start looking for an IBM or Apple system? Please help.

RON WINFREY

San Bernardino, California

Editor's Note: When the CoCo software you want is hard to find, go to where you bought your computer. At any Radio Shack, you will find the Radio Shack Software Reference and Tandy Computer Guide, a catalog of all software and hardware the stores carry for Tandy computers. If the products aren't in stock, they can be ordered quickly.

CHAMPIONSHIP BOXING'S A KNOCKOUT

I read with great interest the review of *Championship Boxing* in the May issue. I was surprised that the graphics were rated "barely acceptable" for the Commodore version. I have played the IBM PC and the Macintosh versions, and consider the graphics excellent. I checked out the Commodore version recently and agree with the reviewer's assessment. It's unfortunate that the IBM or the Mac version wasn't tested. They are far superior to the C 64/128 version, especially with respect to graphics.

PAUL LONGCRIER

Olympia, Washington

HARMONIZING WITH COMPUTERS

Can you please give me information on computers and musical keyboards (especially Casio). I am interested in the best computers and software to use with these keyboards.

DEREK DUNCAN

Morganfield, Kentucky

Editor's Note: You'll find plenty of information on making music with computers in this month's "Buyer's Guide to Music Hardware and Software" on page 36.

FAMILY COMPUTING looks forward to letters from all our readers. Please direct your correspondence to: Letters to the Editor, FAMILY COMPUTING, 730 Broadway, New York, NY 10003. Include your name, address, and telephone number. We reserve the right to edit letters for length and clarity.

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HOME-SCHOOL CONNECTION

MAKE YOUR MOVE WITH LOGO

Here's a Potpourri of Hints and Activities to Provide Some Good Ol' Family Fun with the "Turtle"

BY TOM LOUGH

If you're a parent, you probably know that the Logo programming language is a hot topic in education, and that educators tout Logo's ability to promote thinking and exploration. You probably also know that children as young as four are tackling Logo, and that six- and seven-year-olds are accomplishing amazing feats with the language. So, naturally, Logo programs have become staples in many software libraries.

And as more families buy Logo, more parents like you approach me with this question:

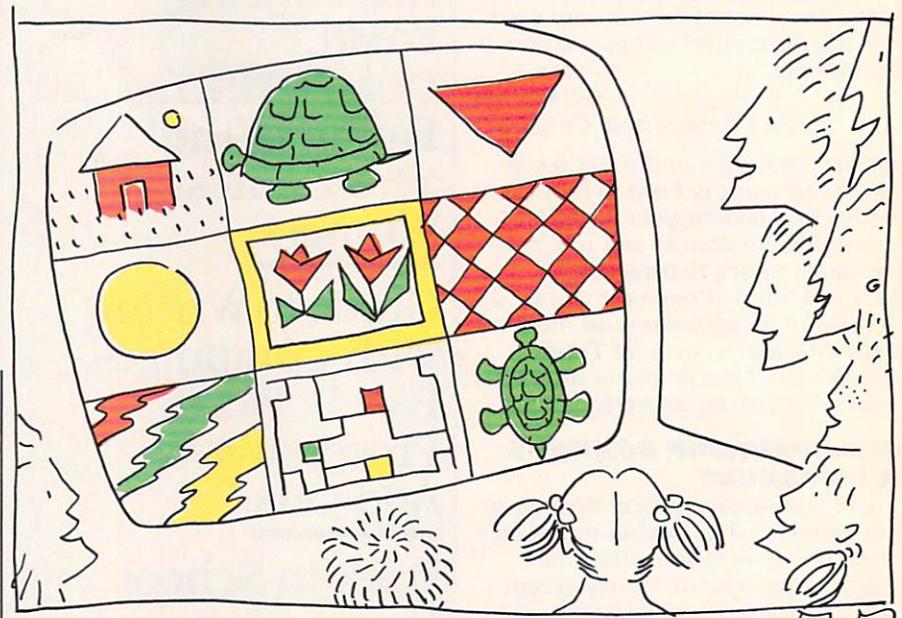
"I bought my children Logo. Now what am I supposed to do?"

Maybe you don't know that Logo is fun. Learning Logo at home should be a pleasure for your children, not a chore. And it can be. With some imagination, you and your family can find uses for Logo that 1) make everyday chores easier 2) promote learning 3) provide hours of fun. Plus, if your children get more exposure to Logo at home, it will help their programming at school—where it counts.

My wife, Posy, and I have discovered many Logo activities that we can enjoy with our 3-year-old son, Kyser. We have many more ideas up our sleeves, which we'll try out when Kyser gets a bit older. You can use our ideas with children of all ages, or better yet, alter our ideas to suit your family.

We have included short, simple programs with some of our ideas. These programs have been tested on Apple Logo II and Atari Logo.

TOM LOUGH frequently writes on the subject of Logo. He's the editor of the National Logo Exchange newsletter.



However, there may be a few slight variations in other Logo versions. If the programs don't work in your version, check your manual; you can

HOW DO I LEARN MORE ABOUT LOGO?

For information on the historical development of Logo and possible applications, you'll want to get Seymour Papert's *Mindstorms* (Basic Books, 1982) . . . Donna Bearden and Jim Muller's *Turtle's Sourcebook* (Prentice-Hall, 1983), Glen Bull's *Nudges: Apple Logo Projects* (Holt, Reinhart & Winston, 1985), and Dan Watt's *Learning with Logo* (McGraw-Hill, 1983) give Logo instruction and include a variety of projects that you can try out at home . . . For parents of handicapped children, Paul Goldenberg's *Computers, Education, and Special Needs* (Addison-Wesley, 1984) is recommended. Logo reading . . . If you have an account on CompuServe Information Service, you can obtain access to its Logo forum (GO LOGOFORUM). There, you can find a wealth of Logo information, including procedures, reports, bibliographies, messages, and frequent on-line chats with other Logo users . . . Check out these articles in past issues of FAMILY COMPUTING: "Learning Logo Is a Family Affair" (February 1984) and "Learning Logo" (a six-part series which appeared September 1984 through February 1985). —TL

probably figure out the changes that are needed. In order to write procedures for the other activities, you'll have to be familiar with the Logo language. See accompanying box entitled "How Do I Learn More About Logo?" Here are our ideas:

PROGRAMS FOR CHORES

• Assign family chores randomly. Do you have tasks or chores around the house that need doing? Well, use our Logo "Chore Chooser" to select the doers. Here's how. Using your Logo program, make a list of your candidates, like this:

MAKE "FAMILY [KYSER DAD POSY]

Then type in the following procedure to PICK one of the candidates at random. After all, who could argue with the computer!!??

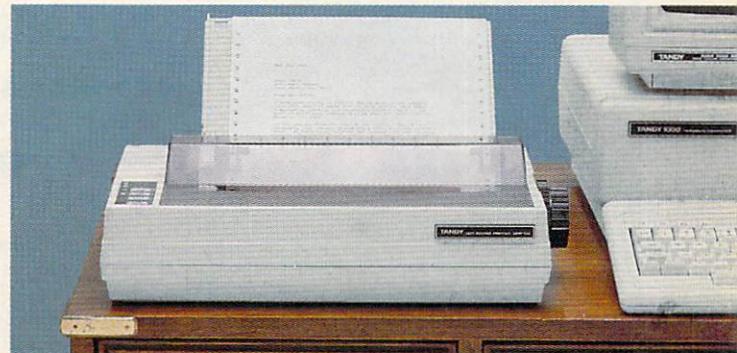
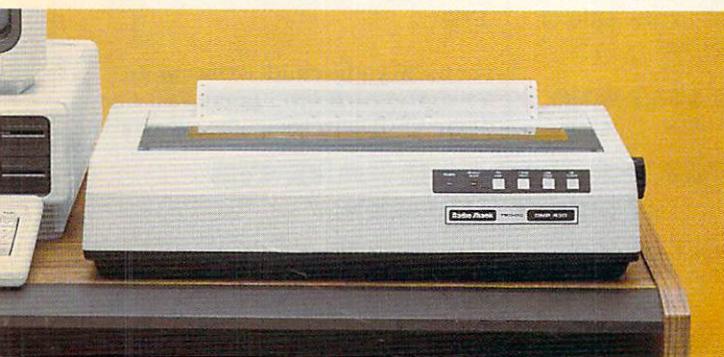
TO PICK :CANDIDATES
OUTPUT ITEM RANDOM (1 + COUNT :CANDIDATES) :CANDIDATES
END
PRINT PICK :FAMILY

Atari Logo users must type in the following procedure before entering PRINT PICK :FAMILY, above: →

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and double-high fonts, as well as bit-image graphics. In the draft mode, the DMP 430 delivers a fast 180 characters per second.

Low-cost, triple-mode personal printer

The DMP 130 (26-1280, \$349.95) lets you choose from word processing, data processing and dot-addressable graphics. Prints in four character styles: standard or italic cursive, in draft or correspondence modes.

Save time while printing

With a PTC 64 Printer Controller (26-1269, \$249.95), you can print one job while working on another. The "print buffer" accepts and stores information from your computer.

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HOME-SCHOOL CONNECTION

```
TO ITEM :N :LST
IF (:N=1) [OUTPUT FIRST :L
ST]
OUTPUT ITEM :N - 1 BUTFIRS
T :LST
END
```

• Print address labels. Last Christmas, Posy suggested that we give my parents a one-year diary of Kyser's activities. We purchased 365 postcards and planned to send them one each day for a year, with details of the antics of their grandchild.

As we organized our thinking, we decided to write a Logo program to print 365 addressed labels with the date in sequence from January 1 through December 31. About half-way through the year, Kyser began taking an interest in what was going on, and he would often add his scrawled "comments" to one side of the postcard or the other!

PROGRAMS FOR LEARNING

- Slow down the turtle. During

my Logo work with young children and older adults, I noticed that the turtle often moved much too fast for them to follow its movements on the screen. For example, the command RIGHT 720 turns the turtle completely around to the right two full turns. But it's not possible to see this happen on the screen. RIGHT 700 turns the turtle almost two full turns, but it appears to be a turn to the left. Surely this is confusing.

Here's a procedure to type in that slows down the turtle so your kids can watch its movement:

```
TO F :DISTANCE
REPEAT :DISTANCE [ FORWARD
1 ]
END
TO R :ANGLE
REPEAT :ANGLE [ RIGHT 1 ]
END
```

Then, if your child types in an R 700, the turtle will make 700 one-degree turns to the right, or nearly

TEN TURTLE TIPS FOR PARENTS

BY LOUISE ROBINSON

1. Try it! These should be the first two words out of your mouth when your child asks: "What will happen if . . . ?" By doing this, you are encouraging your child to take a risk, to discover the answer on his or her own, and preparing your child to try out his or her Logo ideas.

2. Have fun! Find entertaining uses for Logo. Don't ask teachers how Logo fits into the curriculum because, at home, there's no curriculum to worry about. The moment that Logo isn't fun, put the turtle to bed for a nap.

3. Work together! Family projects are a great way to share in the fun, excitement, and challenge of Logo. It's a lot of fun to watch different contributors' work fit together. A screen can be divided, with each person getting a designated area in which to work. Some interesting creatures have emerged when Mom created the head, Dad created the body, and the children added arms and legs.

4. Share! Everyone in the family should have the opportunity to share Logo work. Projects can be shared on the monitor, and if you have a printer, they can be printed out.

5. Let them play! It's important to remember that when children continue to play with any idea, let them. Be patient. They are telling you that they aren't ready to go on . . . yet. Some children play with one idea for a long, long time while others experiment less.

6. Turtle around! Plan to spend time messing around with Logo. Because

Logo doesn't divide itself into neat and little sequential lessons, the best way to learn is by trying anything. For example, try inputting very large and very small numbers, and then watch what happens.

7. Wonder together! As you are setting the table, washing dishes, or driving in the car, you might want to engage in a Logo conversation that begins with: "I wonder if we can get the turtle to . . . ?" Don't be concerned about knowing the answer. You can find it together.

8. Tape it, walk it! Working with Logo only at the computer is very abstract. Provide some concrete experiences for your child. You can use masking tape to help the child tape down on the floor the design he or she wants to draw. Next, encourage the child to walk on top of the tape and "turtle talk" what steps he or she is taking. This is called "playing turtle."

9. Keep it informal! Remember, Logo work at home should be very relaxed for everyone involved. Use your Logo resource books as a guide, not as your leader. Let your family's ideas lead you to discovery.

10. Spread the word! Tell your friends and neighbors what your family is doing with Logo. Show them when they come to visit. Before you know it, you may have others speaking a new language—Logo.

LOUISE ROBINSON teaches Logo at the Indiana University of Pennsylvania.

two complete circles. This allows the turtle's movement to be followed easily and understood more readily.

- Introduce young toddlers to the turtle. Kyser loves to come into the computer room to play with the computer keyboard. When he was just a year old, I wrote a Logo program for him that changed the color of the screen when he pressed a key.

When he was two, I put the turtle on the screen and had it perform some easily discernable random moves and turns each time any key was pressed. And when I noticed Kyser was distinguishing the keys easily, I began writing small Logo programs for particular keys. For example, pressing S might draw a square, C would draw a circle, and so on. Kyser really enjoyed these programs, and we were thrilled when he showed us that he remembered the turtle experiences. For example, one day when Kyser was eating some Doritos, he said, "Triangle. Turtle!"

PROGRAMS FOR FUN

- Make programming a game. How about turning Logo procedures into a secret language? Your family can work together deciphering your code. For example, change the LEFT command to GRYZU by typing in this procedure:

```
TO GRYZU :ANGLE  
LEFT :ANGLE  
END
```

Extend the idea to other movement commands, or make up a secret language for squares, triangles, and the like.

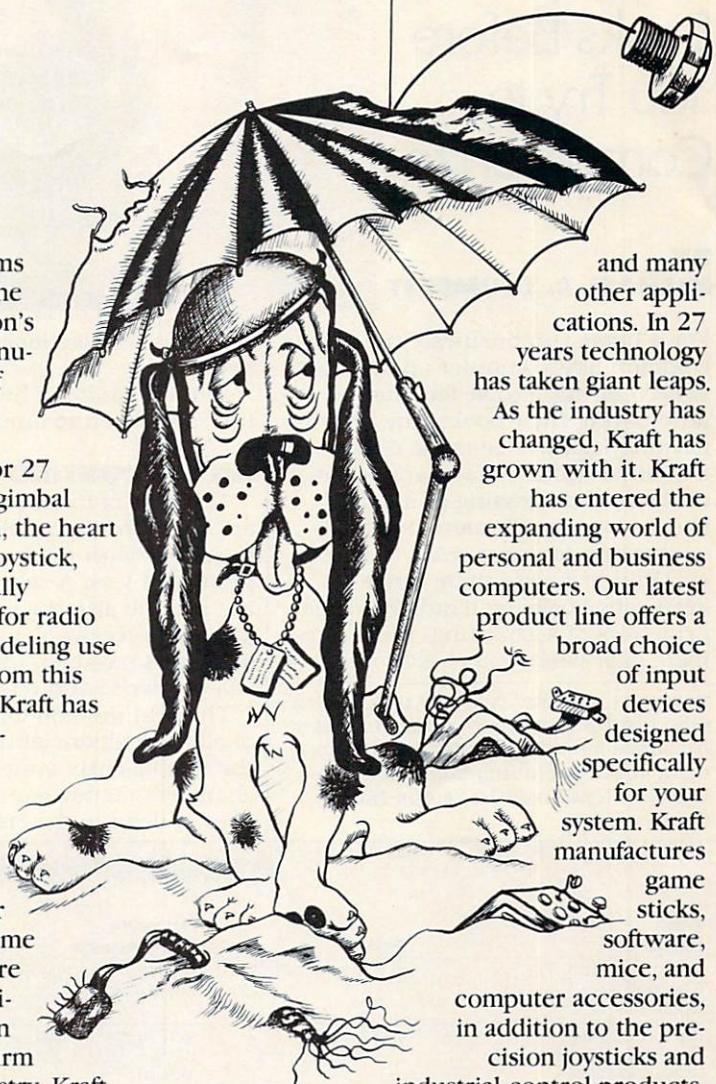
- Organize a family quilting party! Each person might be assigned a square or two of a specific size. The object might be to design a Logo pattern which had some family significance. Then, when all family members have designed their squares, they are all put together to form a family quilt! (Note: This process is described in beautiful detail in Chapter 7 of Molly and Dan Watt's book, *Teaching with Logo* [Addison-Wesley, 1986]).

You might say, "I could never think of ideas like these!" Of course, you can. Once you begin doing things in Logo, you'll become aware of ideas for projects all around you.

Getting ideas for family Logo projects is just like the first assignment in a photography class: Learn to see what is around you. And enjoy! **FC**

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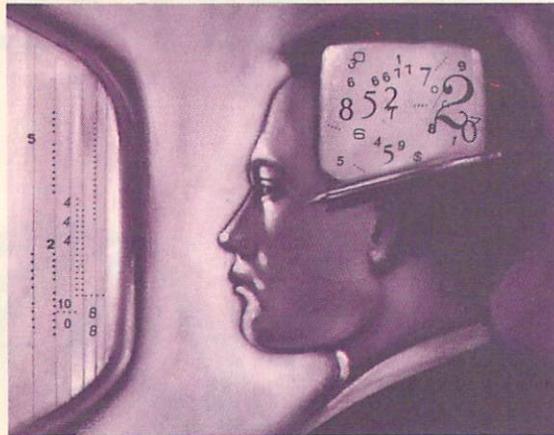
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HOME OFFICE

AUTOMATED ACCOUNTING

Learn
To Keep
Books Before
You Try to
Computerize

BY
MICHAEL C. THOMSETT



For a home-run business, the most common first computer application is accounting. People feel that by automating their books, the record-keeping task will be made easier. But other kinds of software—especially word processing or spreadsheet—have much more practical application for most small businesses. Often it makes more sense to keep your books by hand, learn the principles of accounting, then automate later when you've got more

MICHAEL C. THOMSETT, a former accountant who resides in northern California, is a freelance magazine writer and author of eight books, including *Computers: The Builder's New Tool* (Craftsman Book Company).

business transactions and more experience.

Here's a guide to help you decide how and when to automate.

AN ACCOUNTING PRIMER

The two main tasks of accounting are to record financial information to comply with tax laws and to track profit and loss. A complete accounting routine also tracks money due (accounts receivable), money owed (accounts payable), inventory, and lets you write and record checks.

The best method for keeping track of all these financial transactions is the double-entry system. Every exchange of money requires two entries, a debit and a credit, of an

equal amount. For example, if you sell a product for \$100, you debit CASH and credit SALES, each for \$100. Paying a \$26 bill for office supplies requires a debit to EXPENSES and a credit to CASH, each for \$26.

Double-entry bookkeeping keeps you in balance, as the total of all debits and credits must always "zero out" as follows:

	Debit	Credit
EXPENSES	\$26	
CASH		\$26

When you don't balance, you know there's an error in your books.

These records are kept in a general ledger—the summary of all business transactions. A general ledger lists assets (property you own in the business); liabilities (debts); net worth (the value of the business); and sales, costs of goods, and operating expenses.

THE BEAUTY OF AUTOMATION

The beauty of automated bookkeeping is that you don't have to record the same entry in two or more files. The computer will do it for you. If you enter a credit in the SALES file, the computer will debit the CASH file, etc. The bigger your business, the more time you'll save. Furthermore, the computer will tabulate for you. If you want to see how much money you have coming in, you have to add up all the entries in ACCOUNTS RECEIV-

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Title/ Publisher	Price	Hardware Requirements	Basic Features	Phone Support
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Back to Basics Peachtree Software (800) 247-3224	\$195-\$395	64K Apple, 64K Atari, C 64/128, IBM PC/PCjr, 512K Macintosh	30 report forms, optional AR, AP, GL module (\$95)	free for 45 days
Books! The Electric Ledger Systems Plus, Inc. (415) 969-7047	\$395	256K IBM PC/XT	AR, AP, GL, screen simulations	\$275/year
BPI General Accounting BPI Systems (800) 531-5252	\$395-\$595	48K Apple II, 64K IIe, 256K IBM PC/XT, 512K Mac	AR, AP, PR	free for 60 days
Champion III Business Accounting Champion Software Corp. (800) 243-2626	\$395 per module	384K IBM PC	Six separate modules: AP, AR, GL, INV, PR, JC	\$60/hour or \$1.25/minute
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BusinessWorks Manzanita Software (916) 781-3880	\$95/system manager; \$395-\$495/module	128 Apple IIe/IIc w/two 3.5- inch UniDisk drives	File handling and labeling; optional AR, AP, GL, INV, and PR modules	free for 90 days; \$150/year thereafter
Financier II Financial Software, Inc. (617) 568-0374	\$80	256K IBM, Wang, DEC Rainbow, TI Professional	Budget comparison, check writing, INV, user defined reports	unlimited
Peachtree Business Accounting System Peachtree Software (800) 247-3224	\$199	IBM PC/XT	AP, AR, GL, INV, JC, FA, PR	\$1/minute

AR = Accounts Receivable, AP = Accounts Payable, GL = General Ledger, INV = Inventory, PR = Payroll, JC = Job Costs, FA = Fixed Assets, PO = Purchase Order

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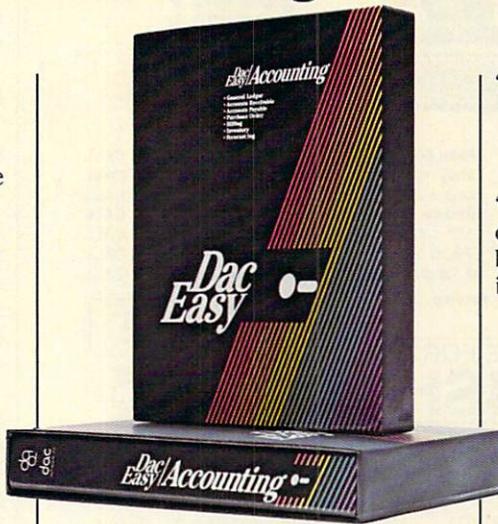
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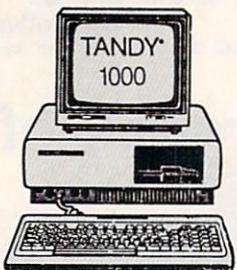
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ABLE. You can do that by hand, by calculator, or by computer. Again, the more entries, the more time you'll save with a computer.

Generally, if you have more than 30 sales coming in, or write more than 60 expense checks or more than 10 payroll checks each month, you are probably ready to automate. Also, if you find you're spending an hour a day keeping books, your volume probably justifies automation.

NOVICE ACCOUNTANTS

Even if you've got a sizeable business, you still have to understand accounting before you automate. The common belief is that automation will make the accounting chore less of a burden, that somehow you will be able to "let the computer do it for you." In reality, you need basic knowledge of accounting in order to operate software successfully.

As an example, the owner of a graphic arts service knew nothing about accounting, but he had to keep books. So he bought an inexpensive program (under \$100) that included a general ledger. He felt that if he were able to automate his books, he wouldn't have to learn how to do it himself.

Understandably, his accounting program never became fully operational. The artist found he was spending more time trying to work around the limitations of the program than he'd spent keeping his books by hand. He ended up hiring a bookkeeper.

On the other hand, I know a plumber who inherited a big business from his uncle. He hired someone to type out 200 to 300 bills every month and manually track all his income and expenses. It took too long to do by hand. He finally bought an IBM PC and VisiCalc, and set up his ACCOUNTS RECEIVABLE.

SPREADSHEET ACCOUNTING

As the plumber discovered, an alternative to using accounting software is setting up and maintaining records on a spreadsheet program. Since all you're doing is adding and subtracting, spreadsheets are the perfect tool.

A business consultant kept a simple accounting record out of his checkbook. Deposits were income, and checks were expenses. This system worked for five years, until his records got too extensive. In his sixth year, he put the entire system on an IBM PC that he also used for word processing.

He used Lotus' 1-2-3 to keep track of his accounts receivable (money others owed to him). He set up a separate file for each customer, and made entries in each file for charges and payments. He formatted the spreadsheet to print out in proper billing form. When he wanted a grand summary, he linked all the files together, and the computer calculated the total.

Because you start fresh at the beginning of each year (or fiscal year), you needn't worry about converting your records from paper to computer. Since you don't need to manipulate old data (in fact, it's illegal to alter "the books"), there's no need to put old data on the computer.

THINK BIG

In a growing business, the day does arrive when an accounting

ACCOUNTING SOFTWARE FEATURES

Before you set out to buy accounting software you should 1) Have a big enough business to justify automation (see article); 2) Understand basic accounting principles; 3) Be prepared to buy an expensive, sophisticated program that will provide for long-term growth. Here are four elements to consider when shopping for accounting software:

MANUALS

When reviewing software, also examine the documentation. Is it understandable? Does it teach you anything about accounting? So many manuals, even for excellent software, are virtually useless unless you're a skilled accountant.

SUPPORT

Some manufacturers will help you via telephone if you run into problems. In some cases, you're given free phone consultation when you buy a package. Don't count on salespeople for accounting help!

FLEXIBILITY

The most important feature in an accounting package is flexibility. You have to be able to expand the number of files and the size of each file. Beyond this, you should be able to "start afresh" each year with a new balance of zero. Some programs make you input false entries to do so. This is a form of protection, which makes it difficult for people to falsify the books. But you should be able to "close the books" on one year without performing circus acts.

PROTECTION

You shouldn't be able to delete an entry under any circumstances. Good programs will require you to remove errors with a reversing entry—one that undoes the mistake.

Also, most accounting software will not let you move on to another task until your records balance or "zero out."

package is needed. At that point, you should shop for software with several key points in mind.

Beyond tracking sales and profits, many accounting programs offer sophisticated planning tools. These include cash-flow projections, budget comparisons, and detailed financial statements. None of these functions is needed in most small businesses.

On the other hand, don't try to save money at the expense of flexibility. Programs costing less will give you less; it's that simple—in my experience at least. If you're willing to revise your bookkeeping procedures to conform to rigid standards and limitations, you can find accounting software for less than \$100. But if you want to be able to alter your general ledger, check register, or billings format, you should be willing to spend more money. After all, you're running a business.

Low-cost programs generally won't allow you to make any changes to the pre-established formats that are part of the program. You have to make accounting decisions at the beginning and stick with the system, which is fine if you are an experienced accountant and have a stable business. But what if you change your system as you learn more about accounting? What if your business grows and you have more transactions? What if you need more room in each customer file? With accounting, it's important that you have the flexibility to update your software as business grows.

Some accounting programs offer total integration. For example, an entry in ACCOUNTS RECEIVABLE is automatically recorded in the general ledger, and so on. Many people find that integration is an advantage, but with accounting, it's sometimes best to keep the "modules" separate. In fact, some programs are sold in module form, so you can add to the system as you progress. With integrated software, if a mistake is made and goes unnoticed too long, you'll have a hard time undoing it without messing up your books.

Because the more expensive and sophisticated programs allow you to fix mistakes and change formats more easily, they are better for novices. With most types of software, of course, the reverse is true.

A small start up business should master computers and accounting separately, before tying the two together. While you are waiting, get your computer working with a good word processing program. ☐

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ENTERTAINMENT

SURVEY

Where Entertainment Software Is Heading, What The Pros Say, and Your Chance to Tell Us What You Think

BY JAMES DELSON

It's time again for readers to speak out on computer games. A number of important changes recently have introduced entertainment software to many new gamers, enriched the playing experiences of us old-timers, and blazed a path for software designers to follow in the future.

FROM THE SIMPLE TO THE COMPLEX

"There have been three major trends since this business started," explained Richard Garriott, better known to gamers as Lord British, designer and programmer of the best-selling *Ultima* series from Origin Systems. "At first, nothing sold but arcade games. Next came the adventure phase. Now we're into fast-moving, well-rounded games which take place in real time. They have role-playing and strategy elements and very good graphics."

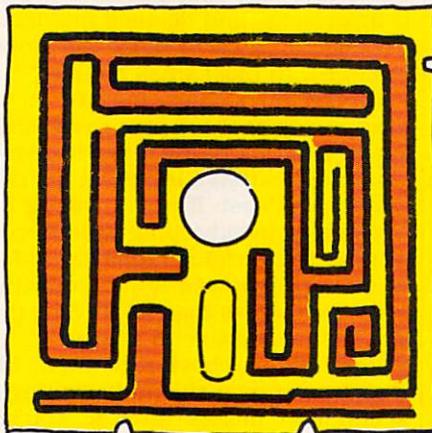
But this stage is only transitional. According to Trip Hawkins, president of Electronic Arts, "We feel the home audience is interested in experiencing simulations of real life, so that's what we're aiming for. Until now, the hardware hasn't been able to offer very realistic sound and pictures, but new machines, like the Amiga and Atari ST, will give us that opportunity."

You're going to see a wide variety of simulators in the next couple of years, and even they will seem old-fashioned before too long. "As compact disk technology becomes standardized throughout the industry," Hawkins said, "the ability to have high resolution pictures, superb animation, great sound, and far more complex programming will create a revolution in the entertainment software field."

THE PUSH FOR MULTIPLAYER GAMES

Hawkins, Garriott, and Joel Billings, the president of Strategic Simulations, all believe the creation of

JAMES DELSON is FAMILY COMPUTING's aficionado of fun software.



more games for multiple players is the current trend.

"One of the best elements of game playing is human interaction," Billings said. "And to some extent this can be replicated by having the computer provide multiple personalities that artificial intelligence can approximate. But since artificial intelligence is still in the Dark Ages, what we're doing now is designing games that get two or more people to sit down together to interact in the same way they play chess."

In order to popularize this type of game, more programs will use handicapping systems so players of varying dexterity, strategy, and other skill levels can compete on an equal footing.

Since widespread acceptance of multiplayer games and breakthroughs in graphics and sound are still in the future, the question remains: What's around the corner?

THROWING A LATERAL

"We're beginning to give gamers something we call 'lateral freedom,'" Garriott remarked. "That is, the ability to decide how they want to play each game. We don't require them to follow a strict path the way so many adventures have been designed thus far. Traditionally, most programs required you to tread a very fine line to win, killing off your characters if you strayed even a little bit off the designer's path. Now we're creating environments in which you can win in a number of ways."

To this end, Garriott is designing solo fantasy role-playing games for Origin Systems. "With these games," he explained, "you can be-

gin playing without instructions. Its narrowed scope allows you to play a mini-scenario in 4-5 hours, and then go on to a sequel."

Based on such material as Flying Buffalo's board game series, "Tunnels and Trolls" and the *Thieves World* novels, these games will be published next year in volumes of six or eight scenarios each.

STRATEGY ON THE RISE

Strategy in gaming has shown enormous growth over the past couple of years. Every game involves some planning, from choosing a direction to steer your Pac Man to deciding how not to obliterate the world in *Balance of Power*. But as the sophistication level of entertainment software has increased, strategic thinking has kept pace, leaving such elements as graphics, sound, and artificial intelligence behind.

"The big industry sellers over the past two years have had a lot of strategy elements," said Billings. "Programs such as *Wizardry*, *Ultima*, and *Silent Service* are all strategy games at heart. Strategic planning will continue to develop in gaming, but in order to make these experiences challenging, the development of artificial intelligence will have to advance as well."

It's clear that computer entertainment is out of its infancy, on its feet, and developing fast. There will be a lot of falls and scraped knees, of course, but the steady output of fascinating software shows no sign of abating. And as long as the public continues its fascination with these games, the field will flourish.

HOW TO GET FREE SOFTWARE!

And now that you've heard from some of the experts, we'd like to get your thoughts on entertainment software. To encourage you to fill in and send us the survey on the next page, we're giving away free games for your computer. Turn to page 15 for details.

FREE
SOFTWARE

FAMILY COMPUTING'S ENTERTAINMENT SOFTWARE SURVEY & GIVEAWAY

What do you think of computer games? Fill out this questionnaire and let FAMILY COMPUTING know. Ten people who respond to the survey will WIN UP TO FIVE FREE GAMES each for their playing pleasure. We'd like to know what you want to read about, what kinds of games you and your family enjoy, and what makes you enjoy them. We'll publish the results and some of your comments next February.

After you fill out this survey, photocopy it or cut it out and return it to "Entertainment Software Survey," FAMILY COMPUTING, 730 Broadway, New York, NY 10003. Those who respond by September 15, 1986, will be eligible for our ENTERTAINMENT SOFTWARE GIVEAWAY. We'll choose 10 people at random and send them five games each, furnished by companies that include these leading publishers: Activision, Avalon Hill, Bantam, Broderbund, Datasoft, Electronic Arts, Epyx, Infocom, Mastertronic, MicroProse, Mindscape, PBI Software, Sierra On-Line, Sir-Tech, Strategic Simulations, and Tandy.

1. What brand(s) of computer(s) does your family own?

Amiga
 Apple II Plus IIe IIC
 Apple compatible
 Atari 800 XL 130 XE
 Atari 520ST 1040ST
 Coleco ADAM
 Commodore 64 128
 IBM PC XT PCjr
 IBM PC compatible (like Compaq or Tandy 1000) Which compatible? _____
 Macintosh 128K 512K Mac Plus
 Tandy Color Computer
 Tandy Model I III 4
 Other _____
 None

2. How many years have you owned a computer? _____

How many years have you been playing computer games? _____

3. How many hours a week is your computer used for game-playing? _____ For other activities? _____

4. Do you often play games with friends on their computers? Yes No

5. Are there any rules governing computer game-playing in your home? Yes No

If yes, please explain _____

6. What activities do you spend less time on since you started playing computer games? (Check all that apply.)

Watching TV
 Reading books/magazines
 Going to movies Playing sports
 Playing board games
 Listening to music
 Socializing with friends/family
 Doing homework

Other _____

7. How do you play computer games? (Check all that apply.)

One person plays at a time
 Adults and kids play together
 Adults play without kids
 Kids play in groups
 Other (please explain) _____

8. How many computer games does your family own? _____

9. How many computer games have you and your family bought in the last three months? _____ In the last year? _____

**10. How much do you usually pay for a computer game? Less than \$10
 \$10-\$20 \$20-\$35 \$35-\$50
 More than \$50 Never buy**

14. What kinds of games does each family member like playing? (List each member's age, and then check all the boxes that apply for each person.)

TYPE OF GAME

AGE AGE AGE AGE AGE AGE

Role-Playing Adventure (like Ultima)	<input type="checkbox"/>					
Strategy/Arcade (like Archon)	<input type="checkbox"/>					
Text/Graphic Adventure (like Wilderness)	<input type="checkbox"/>					
Text-Only Adventure (like Zork)	<input type="checkbox"/>					
Strategy & Tactics (war games, like Knights of the Desert)	<input type="checkbox"/>					
Sports (like One On One)	<input type="checkbox"/>					
Political/Military	<input type="checkbox"/>					
Strategy (like Colonial Conquest)	<input type="checkbox"/>					
Real-Life Simulation (like Jet)	<input type="checkbox"/>					
Arcade (like Boulder Dash)	<input type="checkbox"/>					

15. Looking at the types of games listed above, what type(s) of game(s) do you play more now than you did a year ago? Less now? _____

16. Do you feel that games help people learn? Yes No

17. Where do you and your family get your information about computer entertainment software? (Check all that apply.)

Magazine ads TV ads
 Magazine reviews In stores
 Friends and work/school associates
 If you read reviews, in which magazines? _____

18. When you read about playing games on computers, which of the following do you enjoy? (Check all that apply.)

Tricks and hints for playing games
 Reviews of games software
 A history of computer games
 Strategies on playing games
 Analysis of game genres, such as war games or adventures
 A list of the best games of the year
 Interviews with game designers
 A guide to help you buy games for family and friends
 Other (please explain) _____

11. Who usually decides which computer games to buy?

Parents Kids You

12. Who usually pays for the games?

Parents Kids You

13. Name your family's six favorite computer games in order of preference.

- A. _____
 B. _____
 C. _____
 D. _____
 E. _____
 F. _____

19. What kinds of game information would you like to read more of in FAMILY COMPUTING? Less of? _____

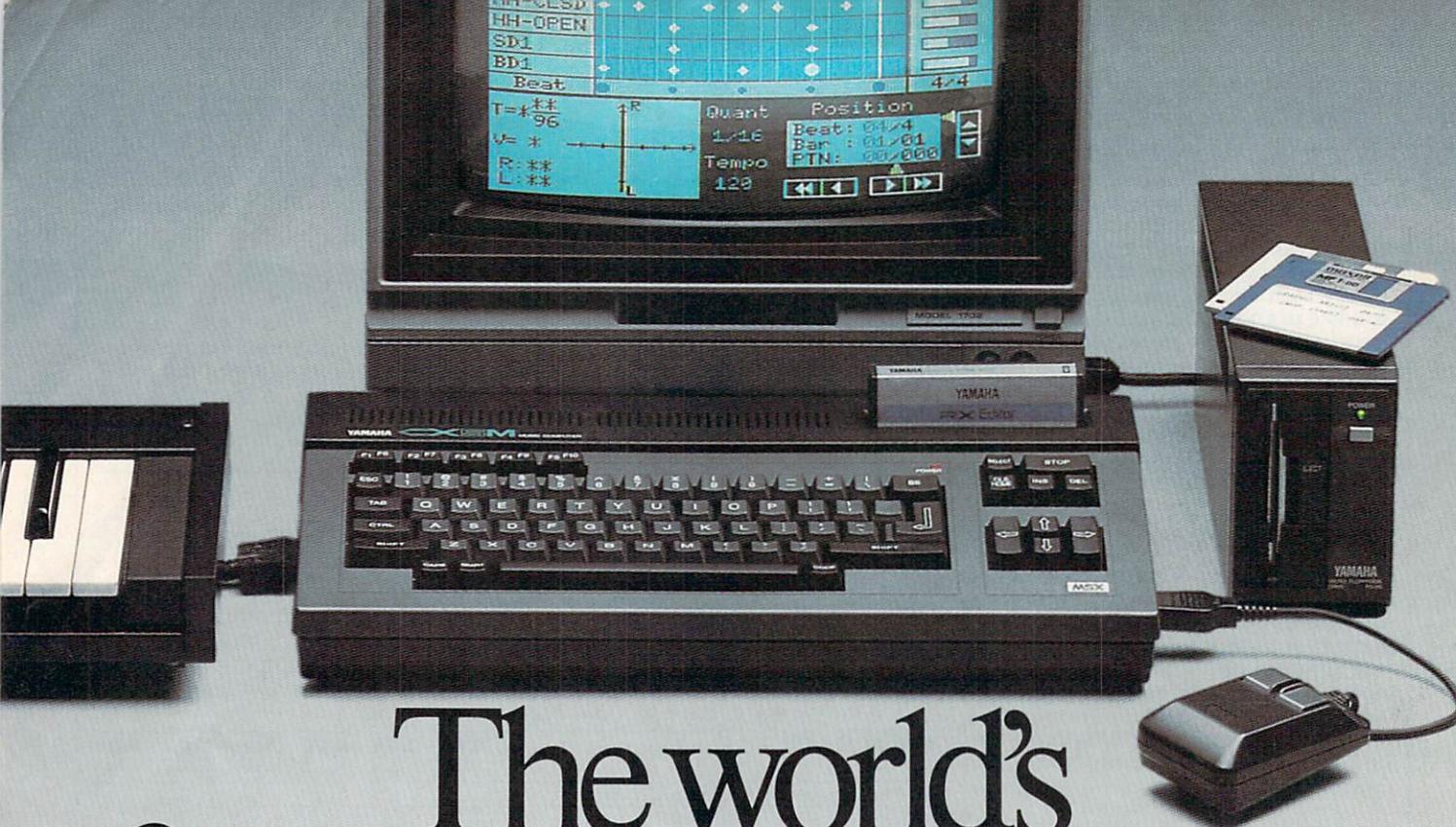
20. Did you respond to the first FAMILY COMPUTING games survey in the June 1984 issue? Yes No Don't Know

Your name _____
 Your age _____ Male _____ Female _____
 List name, age, sex of each family member, and a yes or no to indicate whether or not they play games on the computer (use separate page if needed):

NAME	AGE	PLAY GAMES?
_____	_____	Y <input type="checkbox"/> N <input type="checkbox"/>
_____	_____	Y <input type="checkbox"/> N <input type="checkbox"/>
_____	_____	Y <input type="checkbox"/> N <input type="checkbox"/>
_____	_____	Y <input type="checkbox"/> N <input type="checkbox"/>

Please write your address and telephone number so that we can contact you in the event that you win in the ENTERTAINMENT SOFTWARE GIVEAWAY _____

Thanks. Return to "Entertainment Software Giveaway," FAMILY COMPUTING, 730 Broadway, New York, NY 10003. 



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Now the CX5M is back for its first curtain call. With a broader repertoire.

THE SOFTWARE HAS GROWN.

As you know, a computer is only as powerful as its software. And the CX5M started with some powerful software. Like the FM Voicing program, the FM Composer program, the FM Music Macro program and the DX7™ Voicing program.

Now, with TeleWord™, the CX5M can do words as well as music. This powerful word processing/telecommunications program has such features as global search and change, cut-and-paste text transfer and on-screen page layout. As well as auto-dialer with re-dial function, computerized "phone book" with 50-entry capacity and complete adaptability to all 300- and 1200-baud operations.

So whatever you create with TeleWord's word processor (or other CX5M programs), you can send to computers anywhere in the world.

But back to the world of music with the new MIDI Recorder program. With its four banks, each containing four recording tracks, you can use this program

to compose and arrange music in step-time or real-time from any MIDI keyboard. Edit. Then synchronize playback through DX synthesizers or FM tone generators such as the TX7.

And if you have an RX11, RX15 or RX21 digital rhythm machine, get the new RX Editor program. Because it makes programming easier and more versatile.

Other new programs include DX21 Voicing, Keyboard Chord Master, Keyboard Chord Progression and Guitar Chord Master. Even a Graphic Artist program. As well as second generation FM Music Composer, FM Voicing and FM Music Macro programs. And all the other MSX™ software that MSX computers like the CX5M can run.

THE HARDWARE HAS GROWN.

But the CX5M's hardware is not about to be overshadowed by the software.

Not with such new additions as the SFG05. This module has an FM tone generator with 46 of its own preset voices, an 1800-note sequencer and room for 48 user-programmed voices.

Add the SFG05 to the CX5M and use either the YK01 or YK10 keyboard and you've got a real-time synthesizer. Or with any MIDI keyboard, it becomes a slave module with all the rich, accurate sound of FM digital.

To increase the storage capacity of your CX5M, add the new FD05 or FD03 Micro Floppy Disk Drive.

Each uses 3.5-inch floppy disks for fast access and high storage capacity. And the MSX-DISK

BASIC language is built into the disk drive interface cartridge.

All you need now is a printer and a mouse.

Which is why we have the PN101 dot-impact printer. It doesn't need any special paper to print out your letters, compositions, voice data and other music data to hard copy.

And the MU01 Mouse that you can use to move the cursor around quickly and execute most commands without having to go to the CX5M's keyboard.

THE PRICE HASN'T.

Yet with all this going for it, the basic CX5M computer doesn't go for any more than it did at its debut.

See your Yamaha Digital Musical Instrument dealer. Or write: Yamaha

International Corporation, Digital Musical Instrument Div., P.O. Box 6600, Buena Park, CA 90622. In Canada: Yamaha Canada Music Ltd., 135 Milner Ave., Scarborough, Ontario M1S 3R1.



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PERSONAL FINANCE

INVESTMENT SOFTWARE SAMPLER

Got some money burning a hole in your pocket? Maybe it's an inheritance from a rich uncle; maybe it's a fat raise in salary; maybe you've just decided that the risks and rewards of investments beat the security of a savings account—at least for part of your income.

With a modem to research companies and the stock market (see "Making Investment Decisions" in the Telecomputing department), you can take money matters into your own hands and glean a wealth of company information and up-to-the-minute financial news that will help you make the right decisions. Some individual investors make snap judgments based on this electronic information; others want to sift through it looking for trends and signals. Analytical investors can turn to three main types of investment software: portfolio management (tracking the value and tax consequences of your investments); fundamental (identifying stocks that meet financial performance criteria); and technical analysis (looking for buy/sell signals by graphing price and volume data).

The following packages represent a sampling of communications/investment software.

The Equalizer

Charles Schwab & Co., Inc.: Schwab Technology Services; 101 Montgomery St., 13th floor; San Francisco, CA 94104; (415) 627-7197. For 128K Apple IIe/IIC; 128K IBM PC/XT; modem required; \$199.

The Equalizer is a home-brokerage software package with communications ability that combines trading, research, and record-keeping. It provides a direct link to the computer system of Charles Schwab (see "Celebrity Software" in the July issue), the leading discount broker, for buying or selling securities. The Equalizer package automatically dials DJN/R for quotes and news, and it can retrieve a four-page report on any of over 4,600 companies. A full-color portfolio is automatically updated by Schwab's computer.

The Isgur Portfolio System

Batteries Included, 30 Mural St., Richmond Hill, Ontario, Canada L4B 1B5 (416) 881-9941. For Atari 520ST, 512K IBM PC & compatibles, and 512K Macintosh; modem required; \$200-\$250.

The Isgur Portfolio System, designed by PaineWebber first vice-president Lee Isgur (see "Celebrity Software" in the July issue), differentiates among stocks, bonds, and options, and records each purchase as an individual lot with price, commission, and date. Stock records allow you to enter the full company name, stock exchange, location of stock certificates, and ticker symbol for automatic data retrieval. You can save each stock's yearly high/low/close data, and adjust records for splits and stock dividends.

Managing The Market

MECA; 285 Riverside Avenue, Westport, CT 06880; (203) 222-1000. For 192K IBM PC/XT/AT and PCjr; Compaq (including 286 series); 192K Tandy 1200 HD; 256K Tandy 1000; modem required; \$150.

You can use *Managing the Market* by itself to gather stock prices from Dow Jones News/Retrieval, or as an add-on to other programs. The program allows you to update your *Managing Your Money* portfolio, build and maintain lists of "hot" prices, and see opening, high, low, closing, and volume for each of your stocks, at a glance. *Managing the Market* also works as a free-standing package that downloads stock prices to 1-2-3 or any other DIF-compatible program. *Managing the Market* was designed by financial journalist Andrew Tobias. (See "Celebrity Software" in the July issue.)

Market Analyzer PLUS

Dow Jones & Co.; P.O. Box 300, Princeton, NJ 08540; (800) 257-5114 or (609) 452-2000. For 256K IBM PC/XT/AT; modem required; \$449.

The Dow Jones *Market Analyzer PLUS* is a technical analysis tool that generates multiple charts and graphs for investment decision-making. The program accepts up to one-year's worth of price data and automatically updates it through the Dow Jones News/Retrieval Service. It can also highlight stocks matching certain criteria and generate relative strength and comparison charts.

Market Manager PLUS

Dow Jones & Co. (see above for address). For 128K Apple IIe/IIC; Macin-

tosh; 128K IBM PC/XT; printer and modem required; \$200-\$250.

Dow Jones *Market Manager PLUS* is a portfolio-management system that tracks a variety of investment vehicles. Instant evaluation of holdings is available using the Dow Jones Current Quotes data base. The *Market Manager PLUS* also records pertinent tax information on each security transaction. Dividends, interest, expiring options, stocks going long-term, and maturing bonds are all tracked.

TAS-64

Abacus Software, P.O. Box 7219, Grand Rapids, MI 49510; (616) 241-5510. For Commodore 64/128; disk drive recommended; modem required; \$60.

TAS-64 is a charting and technical analysis system. Price and volume data are automatically retrieved with a modem through Dow Jones News/Retrieval, or entered manually. A number of charts and graphs may be displayed on the split screen to show technical indicators.

Telescan

Telescan, Inc., 802 The Intern Building, 1400 Post Oak Blvd., Houston, TX 77056; (713) 877-1206. For IBM PC & compatibles; color monitor, color/graphics adapter, and modem required; \$50.

With this color graphics investment analysis program, you can transform information obtained through the Telescan data base into customized technical or fundamental stock graphs. These graphs show simple and exponential moving averages, cycles, momentum, trend line, on-balance volume, and relative strength. The graphs allow you to see earnings, book value, cash flow, capital spending and inflation adjustment, and all graphs have separate menu displays.

SOURCES

Sources for this article included The Individual Investor's Microcomputer Resource Guide, a publication of the American Association of Individual Investors (AAII), 612 North Michigan Avenue, Chicago, IL 60611; (312) 280-0170; Norm Nicholson, editor. AAII's bi-monthly newsletter, Computerized Investing, runs an electronic bulletin board (312) 280-8764, that offers public domain investment software. 

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TELECOMPUTING

MAKING INVESTMENT DECISIONS

Use Your Modem to Tap Financial News, Company Information, and Stock Quotes

BY NICK SULLIVAN

Once upon a time, you had to have money to make money. Buying municipal bonds or blue chip stocks only made sense if you had \$10,000 or more to play with. The "little people" had nest eggs tucked away, but never touched them, fragile as they were. For many people, the nest egg was a 5% savings account.

But in the last 10 or 15 years, the nation of savers has become a nation of investors. In the 1970s, high interest and inflation rates and rising college tuition made 5% savings accounts money losers. Smart money went into money-market accounts and bank CDs. In the first half of this decade, Individual Retirement Accounts (IRAs) attracted a new wave of savers turned investors, eyeing the best return for their money.

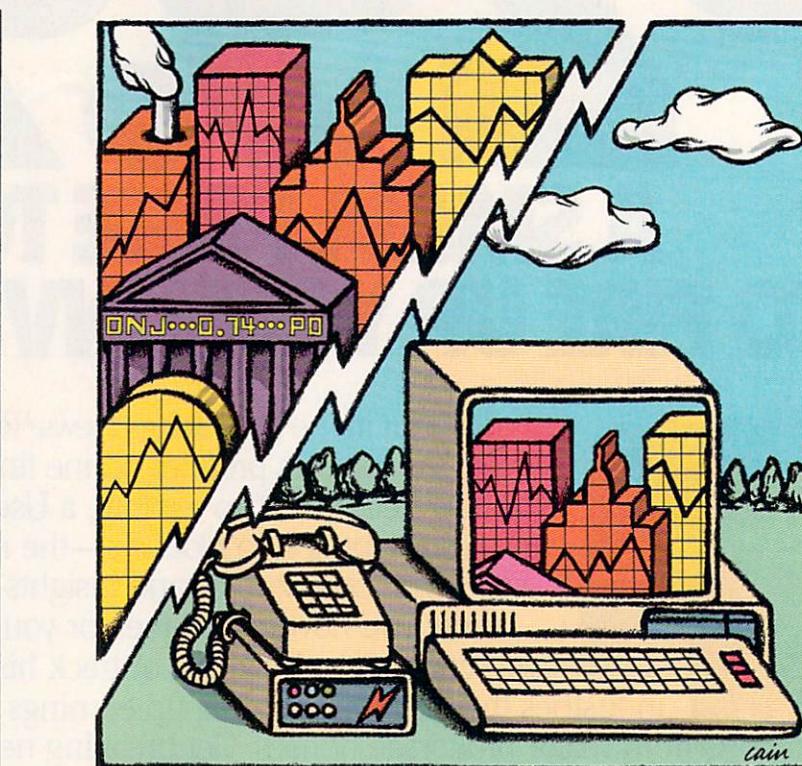
By 1990, a lot of "little people will have \$10,000, \$20,000, or \$30,000 invested. It's a nest egg that will need intelligent coddling, given the unpredictability of world markets.

INVESTMENT VEHICLES

To keep up with all the investment vehicles, such as no-load mutual funds and zero coupon bonds—and to turn opinions into informed opinions—investors need a steady stream of information. In the old days, questions were answered and information provided by your broker. But now, many investors use discount brokerages, which charge lower commissions to execute trades, but don't give advice or information.

And even people who get recommendations from full brokers like to check their own sources of information before making a decision. Fortunately, much of the information that used to be controlled by brokers can now be retrieved with your computer from home, if you connect to one of the major information services. (A modem and telephone line are required). In fact, Dow Jones News/Retrieval, one of the main providers of electronic financial information, started in 1974 as a service for brokers, then opened up to the public in 1979.

Besides getting financial data hot off the press, the other beauty of electronic information is that you



can use investment software (see *Personal Finance department*) to chart trends, study them, and make buy and sell decisions.

FROM TOKYO TO KANSAS

From your little house on the prairie, computers and electronic databases can put you in touch with: 1) stock and commodity market quotes, either "real-time" or delayed 15 or more minutes; 2) facts, figures and reports on thousands of companies from financial analysts at brokerage firms, Standard & Poor's, Value Line, and Media General; 3) historical quotes and analysis of market behavior, by the day, week, month, or year; 4) business and financial news from the Associated Press, UPI, Washington Post, Wall Street Journal, or Barron's; 5) discount brokers who will execute buy and sell orders for you.

Of course, not all networks can give you all this information (see *list of major financial data vendors*). Serious investors looking for up-to-the-minute news, stock quotes, and the widest range of available research, should look first at Dow Jones News/Retrieval and Compu-

Serve. As a financial news organization, Dow Jones delivers a wealth of financial information and presents it in an efficient manner. CompuServe, on the other hand, offers similar financial information at a lower rate.

"Dow Jones News/Retrieval has given me the ability to make a living as an investor. It's given me the information and the software to analyze the information," says Eugene Zachman, 53, of Mission Hill, Kansas. "If I want to check a stock's past performance, I don't want to read through 10 weeks of the *Wall Street Journal*. I'd rather go on-line and push a button."

The former insurance company president is now a full-time investor, and manages six portfolios for various members of his family. He spends 30 or more minutes a day on DJN/R, downloading information of interest to study later, and keeps his monthly bills around \$100-\$200.

On DJN/R, you can read real-time or 15-minute delayed stock quotes (the real-time quotes cover the Pacific and Midwest exchanges as well as the New York exchanges), full-text of all articles from the *Wall Street Journal* or *Washington Post* (from

January 1984 on, and selected articles back to 1979), and daily reports from the *Japan Economic Daily*.

In addition, breaking stories on the Dow Jones Newswire are posted on DJN/R 90 seconds after they come across the wire. Transcripts of "Wall Street Week," the popular Friday night TV show, are also posted.

DOW JONES NEWS AND QUOTES

Dow Jones combines its news and quotes in a nice fashion. Say you sign on and want to check the current price of a stock you're following. You type //CQE for "enhanced current quotes." At the ENTER QUERY prompt, you enter the stock symbol, such as IBM. You are informed if there's a new item for that company on the Dow Jones News Service.

You can act on that news in a number of ways that were not possible only a few years ago. Put the news into perspective by scanning historical quotes to get a trend line for the past year; scan Media General Financial Services to track the stock's performance daily, weekly, or monthly against the average for its industry; look at past and projected earnings reports; and survey analysts' predictions for the future. And, if you're a member of Fidelity Investor's Express, you can buy or sell shares on-line.

As icing on the cake, DJN/R gives users itemized statements of usage. Since money spent researching investments can be tax deductible, these statements can prove to the IRS that you were researching stocks, and not just checking base-

ball scores or movie reviews (which you can also do on DJN/R).

COMPUSERVE

While CompuServe can match most of Dow Jones' offerings, it cannot match the Dow Jones news. On The Source, the financial data bases are not as complete as those on CompuServe and DJN/R.

CompuServe, however, has two feathers in its cap. One is a comprehensive listing of no-load mutual funds, broken down according to investment objectives. You can, for instance, get a listing of capital appreciation funds, growth funds, and income funds, and request that information on the funds be sent to you.

Second is the Investor's Forum, allowing you to read and leave messages, read and download files or programs, and join in live conferences with other investors. For a novice investor, the interchange of ideas and people contact afforded by the Investor's Forum is a great way to learn and pick up tips.

"When a person has a hot hand in option trading, for example, people will stop by the Forum several times a day to see if that person has posted news of a new trade," says Mike Pietruk, assistant vice president of Preferred Savings and Loan in Chicago, and an administrator of the Investor's Forum. "The Forum thrives on rumors, option plays, etc."

NEWSPAPERS, TV, TELEPHONES . . .

Pietruk emphasizes, as do Zachman and other investors, that the computer does not replace other in-

vestment tools; it supplements them. After all, there's nothing magic about placing a buy or sell order by computer, when you can pick up the phone and call a broker for less money. And people who have brokers may get the same or better information and advice as they do online, for about the same price. Some brokers, such as E.F. Hutton, even offer their clients electronic access to their analysts' stock recommendations.

Even people who use discount brokers and make all their own investment decisions can use old-fashioned sources such as the *Wall Street Journal*, or PBS' respected TV shows, "Wall Street Week," and "The Nightly Business Report."

. . . COMPUTERS

How much you need access to electronic financial data depends on how active a trader you are, and/or how much you enjoy playing the money game. It also depends on what you plan to do with the data once you get it. "You have to get the information, there's no way around that. But without the software I use, *Market Analyzer Plus* (Dow Jones & Co.), I wouldn't be nearly as successful in making decisions with the information," says Zachman.

"On a stock I'm following, I can download two years of historical quotes from DJN/R. Then I put that up on the *Analyzer* to chart decline lines, volume indicators, etc. I can set buy or sell signals and keep following the stock until it hits them."

You couldn't do that by going to the library and poring over historical quotes. ■

ELECTRONIC FINANCIAL INFORMATION

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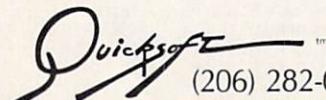
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COMPUTING CLINIC

I have a Tandy Color Computer 2 with 64K and a cassette recorder, for which I'd like to get 1) a 3-D drawing program that allows image rotation and 2) a digitizer that would work with a video camera and VCR.

PAUL KLONOWSKI
Newton, Massachusetts

Owl-Ware (P.O. Box 116, Mertztown, PA 19539; [215] 682-6855) sells a drawing program called 3-D Designer (\$30), which does image rotation. However, it's only available on disk.

Owl-Ware also sells CoCo disk drives. A video digitizer, which allows you to load video images from a camera into your computer, is available from The Micro Works (P.O. Box 1110, Del Mar, CA 92014; [619] 942-2400). It's called DS-69 DigiSector, costs \$100, and includes software on both cassette and disk. The DS-69A (\$150), is a faster version of the DS-69 and allows you to stop a moving image. —H.B.

As a computer programming teacher in the Chicago public schools, I introduce my students to BASIC on the Apple computer by having them create low-resolution graphics. Unfortunately, I have not yet found a way to print out these pictures so that my students can have permanent copies. Can you help? I'd like to print them in color, if possible.

WILLIAM ANDERSON
Chicago, Illinois

To take a "snapshot" of the screen, you need a screen-dump program, such as *Triple-Dump* (\$40), from Beagle Bros. (3990 Old Town Avenue, Suite 102C, San Diego, CA 92110; [619] 296-6400). You might also query the same company about *Beagle Graphics* (\$60), a drawing program that will allow your students to create high-resolution graphics in 16 colors.

Printing graphics directly from BASIC, on the other hand, is an interesting programming challenge. Why not work on it with your students? Color printers will respond to

Questions are answered by Henry Beechhold, author of *The Plain English Repair and Maintenance Guide for Home Computers*, (Simon & Schuster, 1984) and Karen Kane, FAMILY COMPUTING's researcher.

special control codes (CHR\$) for color selection. Or, you can get simple color effects by changing ribbons (six color ribbons are available, for example, for the Epson FX-80). —H.B.

I'm always tired and stiff after sitting at my computer for several hours. What can I do to make my time at the computer more comfortable?

LEE ATKEN
New York, New York

According to Bruce Hannah, an industrial designer in New York City, there are several easy ways to reduce computer-related fatigue:

- Give yourself flexibility. The ability to adjust your chair position, monitor angle, keyboard height, and light intensity helps to maintain a comfortable work environment for anyone using the computer.

- Don't face a wall (if you can help it). When you look up from your computer to rest (and you should now and then), the more distant the vista, the more relaxed your whole body will be.

- Avoid high-contrast surfaces. A light-colored desktop and work area can reduce eye strain.

- Use a foot rest. Lifting your legs, even slightly, can relieve fatigue. Even a pile of old telephone books will do the trick.

—K.K.

Can I use my Tandy 1000 computer in Europe simply by adding a step-down transformer (220 to 110VAC) or will the difference in line frequency (50 Hz instead of 60 Hz) prevent me from doing so?

ULF KALLENBERG
Miami Lakes, Florida

According to Tandy, you can use your Tandy 1000 in Europe by purchasing an external step-down transformer from a Radio Shack in Europe. (Converters sold by Radio Shack in the U.S. are intended for use with small appliances, such as hair dryers, and are not suitable for use with computers). You should not have problems with the difference in line frequency, but if you need any assistance while in Europe, Tandy will support an American-made product used in Europe.

Also, several Zenith personal computers and the IBM PC Portable can operate at 50Hz or 60Hz without a transformer.

—H.B.



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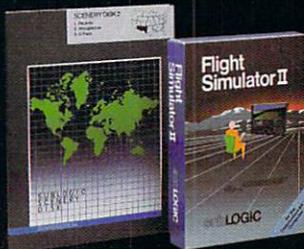
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See Your Dealer. Flight Simulator II is available on disk for the Apple II, Atari XL/XE, and Commodore 64/128 computers for \$49.95. Scenery Disks for the C64 and IBM PC (Jet or Microsoft Flight Simulator) are \$19.95 each. A complete Western U.S. Scenery six-disk set is also available for \$99.95. For additional product or ordering information, call (800) 637-4983.

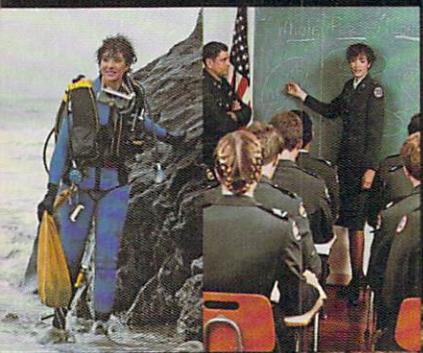
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Catherine Fahey, Junior
University of California, Santa Barbara



Dial M For **MAIL ORDER BUYING**

IF YOU KNOW WHAT YOU WANT,
MAIL ORDER BUYING CAN SAVE YOU
TIME, MONEY, AND EFFORT

BY DAN GUTMAN

Planning to buy a computer system for the family this year? At Computer Factory in New York City, you could get a nice system—an Apple II computer, a monochrome monitor, and an ImageWriter II printer.

Price—\$1,300.

Or, you could buy the exact same system by mail from 47th Street Computer ([800] 221-7774), also based in New York City.

Price—\$1,099. You save \$201.

Looking for Lotus 1-2-3 to do office work at home? When we called ComputerLand, it was on sale.

Price—\$375.

On the same day, the same program was available from a mail-order company.

DAN GUTMAN, who lives in New York, writes a syndicated newspaper column on computers.

Price—\$309. You save \$66.

Need ribbons for your Commodore 801 printer? You could look for them in K-Mart where you bought the printer, but you won't find them there anymore. You can get them from a mail-order house called Protecto Enterprizes ([312] 382-5244), which, in addition to computers, stocks a wide variety of peripherals—even speech synthesizers and out-of-production items that aren't available in stores.

Big savings is the main reason why so many people now buy computer hardware and software through the mail. Mail order prices are 15% to 50% below store prices. "At electronics stores you pay an arm and a leg," says Al Muick of Laton, Oklahoma, who ordered a power sup-

ply for a disk drive from Jameco Electronics ([415] 592-8097). "If you buy from a mail order company that specializes in the product you're ordering, you're going to get a better deal than buying from 'Joe Distributor' down the road."

Besides price, convenience is another reason to buy mail order—especially for people who live in rural areas and aren't close to computer outlets. People looking for out-of-stock products may find that mail order often presents a wider selection of goods than computer stores, which stock primarily best-sellers or new products that are heavily advertised. And people who own computers no longer in production—e.g., the TI 99/4A, IBM PCjr, and Coleco Adam—often have no choice but to buy through the mail.

Mail order used to be considered a shady business that smart consumers would avoid. Today, with the rise of big catalog houses, such as L.L. Bean, Lands End, Williams-Sonoma, and many others, buying consumer goods through the mail is mainstream.

The computer mail-order phenomenon is part of this trend. Note that 81% of FAMILY COMPUTING readers have bought a product by mail or phone over the last 12 months, according to a study by Simmons Market Research Bureau, a large New York media research firm. One year ago, the figure was 73%.

You can buy just about any computer equipment by mail order: business software, productivity and learning software, games, accessories, and even full computer systems. In fact, many manufacturers of the new PC-compatible computers, such as PC USA, Mainstreet, PC Connection, and PC Designs, sell by mail only.

As long as you know what you want, accessories such as printer ribbons, dust covers, and computer paper are naturals for mail ordering. In fact, buying such commodities by mail is a good way to get your feet wet. You can't go too far wrong, and you'll save time and money.

MAIL ORDER SECRET #1

How do mail order firms do it? The number one secret is quantity. "A computer store can only afford to buy a few units at a time, but we buy 200," says K. Chuck Doran of Computer Mail Order ([800] 233-8950). The company, located in Williamsport, Pennsylvania, stocks more than 7,000 computer-related items. Mail-order firms sometimes buy stock directly from the manufacturers, but more often buy from distributors or from computer stores that need to move excess inventory. "Dealers have to keep their numbers up," says George Sutyak, general manager of Northeastern, a large mail-order house specializing in Apple II, IBM PC, and Macintosh products. Like many mail firms these days, the company also sells its own computer, the Northeastern Turbo PC.

According to industry insiders, companies like Lotus and IBM don't like their dealers selling products to mail-order houses, a practice referred to as the "gray market." To stop the practice, they sometimes buy products from mail-order dealers, and trace the serial numbers back to the original dealer, who is then punished. But the "gray market"

shouldn't bother the consumer, because either the manufacturer, the dealer, or the mail-order house (or some combination) generally honors the warranty.

Manufacturers that sell through mass merchandise chains, like Atari and Commodore, are more likely to sell directly to mail order houses.

Great Western Electronics takes a different approach. It's a Tandy/Radio Shack franchise with a regular Radio Shack Store in Montrose, Colorado, but also sells all of the Tandy computers by mail, at reduced cost. The computers come to Great Western directly from Tandy. "We charge less for the mail-order computers because we don't provide the same service we do in the store," says Jim Faulkner, owner of Great Western Electronics.

MAIL ORDER SECRET #2

Secret number two to the low prices is overhead—or lack of it. When you spend \$1,000 in a computer store, a good chunk goes for street-front rent in a shopping district, furnishings, salaries, and services. A mail-order company really just needs a warehouse, a few magazine ads, and somebody to pick up the phone. The bigger and better outfits, however, bolster this skeleton crew with good technical phone support. "Customers get better service from us than they do from a place like K-Mart," says Pete Sattler, part owner

WHAT SHOPPERS THINK ABOUT MAIL ORDER

Many computer owners have bought by mail or are willing to do so, according to a FAMILY COMPUTING survey conducted on CompuServe. Only seven percent said they would never purchase computer equipment by mail; 72% said they already bought equipment by mail.

Of those buyers, 55% were "very satisfied," and 25% were "somewhat satisfied" with the service. Only 3% were "not satisfied." Product orders broke down like this: Software (72%), peripherals (50%), accessories (36%), and computers (10%).

The single most important reason people buy from mail-order houses is "lower prices," noted by 50% of respondents. The single most important drawback is that "you can't see or try out what you're buying," noted by 67% of respondents.

Nearly 250 people participated in the survey, which ran for three weeks in April. FAMILY COMPUTING conducts monthly surveys on CompuServe (type GO FAM) to "take the pulse" of computer owners.

of Tussey Computer Products ([800] 468-9044).

The more technically sophisticated the product—say, a speech synthesizer or an accounting software package—the closer mail-order houses can match the service of a retail outlet. That's because few store salespeople understand those products very well.

MAIL ORDER DRAWBACKS

Even though some mail-order houses offer good support, the biggest drawback of mail order is still that you have to buy "blind." Unless you've seen or used a given product elsewhere, you don't have the opportunity to try it out. And you don't have the chance to meet the salesperson, shake hands, and form a relationship that may come in handy if you have problems later. As far as training goes, mail order houses certainly don't offer training seminars like many computer dealers do.

If anything goes wrong with a product, especially a computer, you can't bring it back to the dealer for a quick checkup. You have to mail the product back, which takes time and money. Of course, no matter where you buy, you sometimes have to mail a product back to the manufacturer.

Another drawback to mail order is that you can't plop your money on the counter and walk out of the store with a shiny new product. A mail order house generally needs a week or two to deliver the product, though you can usually get overnight delivery if you're willing to pay for it. Backlogged mail order houses might take eight weeks to deliver, especially around the Christmas season. And you won't know until the product comes how long delivery will take. However, a good mail-order house should tell you if the product is in stock and when it will be mailed.

Finally, don't expect to find the latest products on the market at mail-order discounts. While new software releases might be available within three weeks, most high-ticket hardware won't filter down to mail order for several months. If you want to be the first on your block with a hot, new product, go to a dealer.

MAIL ORDER FEARS

The biggest fear about mail-order companies is that they're going to take your money and run. "The problem is worst at Christmas when you see ads from a lot of companies you've never heard of," says Protec-

MAIL ORDER DELIVERS

to's Bill Badger. "Most won't be around on January 1."

Your local computer store, naturally, isn't too thrilled about the whole idea of mail order and will sometimes foster the belief that mail order is a scam. A lot of people go to a computer store to decide what they want to buy, and then make their purchase through a mail-order company to get a lower price. Thus some computer salespeople tell you that if you buy mail order and have any problems, there's nothing you can do. This is not usually true. Other salespeople tell you that mail-order software is pirated software or that mail-order companies will simply take your money and go out of business.

Some companies will go out of business without returning your money. Judy Hunt, from Napa, California, sent a check for \$300 for an Adam disk drive and a subscription to a newsletter called *Garden of Adam*. Her check was cashed the next day, but she received just one issue of the newsletter and no disk drive. After many calls to complain and letters to the attorney general's office, Hunt finally brought suit in small claims court and got her money back. It took eight months.

"When I called the postmaster's office, I found that this guy had ripped off many, many people," says Hunt. However, other than that one bad experience, Hunt has no complaints. "I still order through the mail. With Adam, it's the only way to get supplies," she says.

Even manufacturers sometimes get burned by mail-order outfits. Hercules Computer Technology, Inc., which makes both color and monochrome graphics display adapters for the IBM PC, brought suit against two companies that it says were violating their copyrights by selling Hercules "clones" with copies of Hercules documentation and software.

"There are always people out there ready to rip you off," says Computer Mail Order's Doran. "When you don't see people, you can take liberties with them." Protecto's Badger says: "If someone takes your money and runs, there's not much you can do, especially when dealing with goods that have crossed state lines."

But, as most people realize, there are shady outfits everywhere. And a mail-order house that has been in business for a while has a reputation to uphold. Northwestern's Sutyak says, "All mail-order companies are privately owned, and none belongs to a group like the Direct Marketing Association. We're more or less a self-policing industry. Word of a bad deal gets around."

In talking with people who've used mail order, we found that mail-order companies almost always deliver what they promise. If you have problems with your equipment or payment, they usually make an effort to solve it as quickly and painlessly as possible. Most mail order companies are not fly-by-night swindlers. They want you to be a regular customer.

"Every computer I sell is worth \$1,000 in future sales," says Protecto's Badger, whose company spends \$3 million a year on advertising and direct mail. Logicsoft, a Farmingdale, New York mail-order distributor ((800) 645-3491), says it posted \$80 million in revenues last year, and recently signed an agreement for a \$2 million advertising campaign. You know this company isn't a couple of guys working out of a bus terminal somewhere.

In some ways, mail order can be more legitimate than a regular store. The salespeople in a computer store usually work on commission; the more money they take in, the more they keep for themselves. Sometimes they'll try to sell you obsolete products to clear their shelves, or products that are more elaborate and expensive than you need. The people answering phones in mail-order houses don't get a commission on sales. So you can simply tell them what you want to buy.

MAIL ORDER CUSTOMERS

Is mail order right for you? A few years ago people would walk into computer stores and ask, "Can you tell me what a computer does?" Today, people are more knowledgeable, and don't require as much training or hand-holding. Nonetheless, it is wise to make your first purchases in a store near you, so you can walk back in the next day to iron out start-up problems. You should be willing to pay a little extra for that service.

But if you've already got a system and just need a new disk drive or a piece of software, or if you live in a rural area and don't want to spend Saturday driving across the state—mail order may be perfect for you. If you're experienced with computers and know exactly what you want, there's no reason to pay extra for some salesperson to hand a product across the counter to you.

Just take a few precautionary steps before diving in. Then pick up the phone, sit back, and wait for your package to arrive. ■

HOW TO EVALUATE MAIL ORDER COMPANIES

- Find out if the mail-order company has advertised over a period of time. More often than not, steady advertising means a steady company. In the holiday season especially, be on the lookout for "one-shot" companies that go out of business on January 1. A "money-back" guarantee, free trial period, and a toll-free (800) phone number are usually signs of a reliable company.

- Call the local Chamber of Commerce and ask what they can tell you about a certain mail-order company. Unless it's brand new, the company should be a member, and should be listed. You can also call the Better Business Bureau, but they might not have complaints about a company on file until at least 90 days after the fact.

- When you call a mail-order house, ask a few general questions—even if you don't know the answers—to see how knowledgeable the staff is. If the answer is, "We just take orders," hang up. It might mean they don't have the product in stock and won't get it until they receive enough orders. It certainly means that you'd have trouble getting technical support after you buy.

HOW TO PLACE A MAIL ORDER

- When you're ordering from a mail-order house for the first time, place a small, inexpensive order. See what happens. If the service is good and as advertised, go back for more.

- Before you place an order, ask about the warranty: Is the manufacturer's warranty good, or does the mail-order house offer its own warranty? If the mail-order house has a money-back guarantee, ask how long you have to return the product. Some houses offer a free "trial period."

- Ask how and when the merchandise will be shipped. Postal regulations require a company to notify you within 30 days if the item you've ordered is out of stock; a good mail-order house will do so immediately. If the product doesn't arrive within two weeks after the given shipping date, ask for a "tracer" on the order.

- Read the fine print. Be careful to see if there are shipping charges, handling charges, or surcharges for credit card users. Some mail-order houses charge an annual "membership" fee, which offers you no benefits and is, in effect, a surcharge. Others will ship overnight mail (Federal Express) if you buy a minimum amount, such as \$50, and charge you the standard "ground mail" rate.

- Remember that you don't have to pay taxes on goods bought in another state. If a state has a 5% sales tax, and you buy a \$1,500 computer, you can save \$75 (which can cancel out the shipping charge.)

—NICK SULLIVAN

Finding the Right Word Processor

TAKE OUR QUIZ, TALLY YOUR SCORE,
AND CHECK THE CHART
TO FIND THE RIGHT PROGRAM
FOR YOUR NEEDS

W

hen shopping for computer software or hardware, it's too easy to assume that a computer store will sell you the right product—just because it's a computer store. But that's a big assumption.

Say you want to buy a word processing program so you can write letters, novels or business reports. If you go to a computer specialty store, you might get a choice of *XyWrite III*

Contributing editor ROBIN RASKIN's last article was "How to Throw the Best Birthday Party on Your Block," in the June 1986 issue. STEVE MORGESTERN, also a contributing editor, wrote "Soup Up Your Software," also in the June issue.

or *Word Perfect*. If you go to a discount store, you might find *Bank Street Writer* and *PaperClip*. Maybe they're right for you, maybe not. These are good programs for the right person. But is that you?

The salesperson in either outlet isn't likely to ask, "Who are you and what do you want to do?" He or she may try to sell you what's in stock—not what will necessarily best suit your needs.

To help point you in the right direction before you start shopping, we've devised a word processing quiz. It will help you examine your writing style, and ask how fancy you want your final printouts to be. The quiz is

not infallible, of course. It falls under the heading of "inexact science" (just like writing itself!), because it won't be able to tell you whether you'll like using a particular program. But it will make you think about your needs, and that will make you a smarter shopper.

When taking the quiz, unless otherwise noted, select just one answer to each question. Circle the letter next to it. After you've answered all questions, tally your score and see which category you fall into: FAMILY, FAMILY/PROFESSIONAL, or PROFESSIONAL. Then go to the chart accompanying this article, where programs are listed by these categories.

A WORD PROCESSING QUIZ

- 1** I plan on using my word processor:
a. Daily (4)
b. A few times a week (3)
c. A few times a month (1)
d. For occasional complex jobs (5)
e. For occasional simple jobs (2)

- 2** The word processor will be used by:
a. Person performing secretarial chores (5)
b. At home by adults (3)
c. A professional/writer in office or home office (4)
d. The entire family (2)
e. Children younger than 8 (1)

- 3** I plan to use the word processor primarily to create:
a. Newsletters or long formal documents with indexes, and contents pages (5)
b. Short, often repetitive business letters (4)
c. Business reports or professional manuscripts (3)
d. Term papers, homework assignments, rough manuscripts (2)

- e.** Household correspondence, or lists (1)

- 4** The length (typewritten, double spaced) of my typical document is:
a. 1-2 pages long (1)
b. 3-5 pages long (2)
c. The size of a term paper (5-15 pages) (3)
d. The size of an annual report (30-50 pages) (4)
e. The size of Tolstoy's *War and Peace* (5)

- 5** The people viewing the printouts will be:
a. Teachers and professors with stringent formatting guidelines (4)
b. In-house colleagues, thankful they can read my ideas (3)

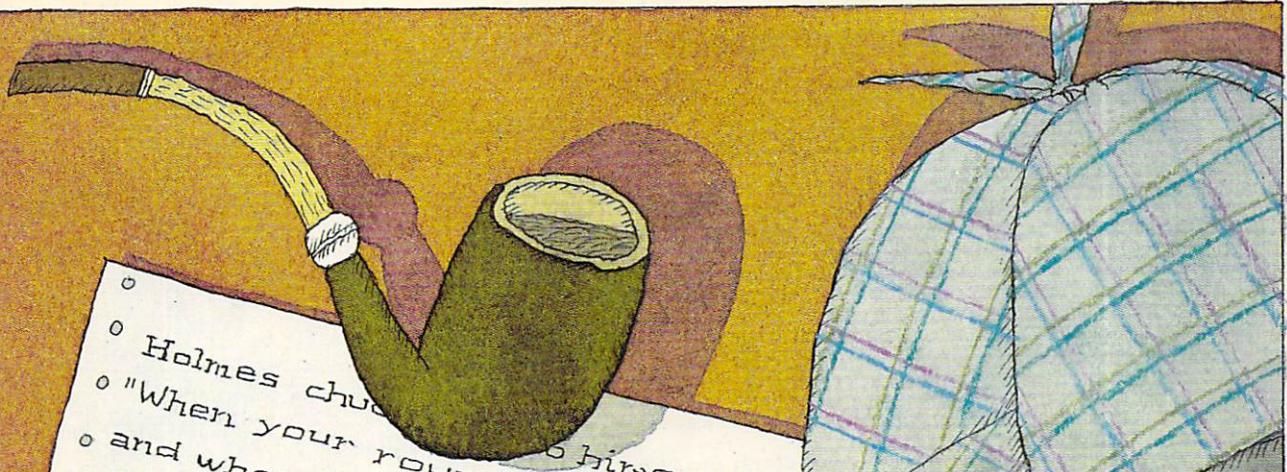
- c.** Clients or employers who need to be impressed by the looks of my document (5)
d. Friends and relatives who care about content more than looks (2)
e. Young kids learning to type (1)

- 6** The following best describes the type of writing I do:

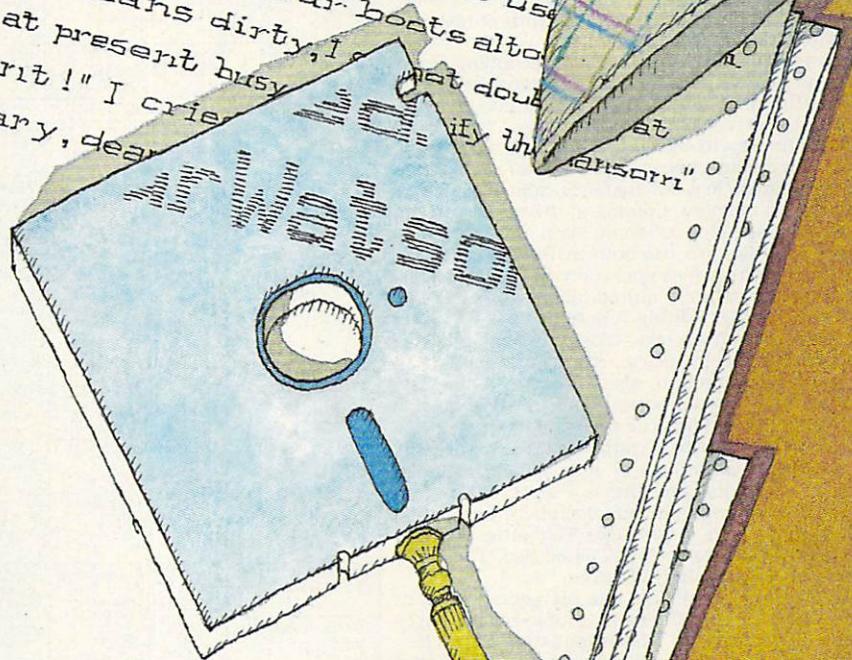
- a.** I create different documents every time I sit down to write (2)
b. I transcribe or copy from a book or other hard copy (3)
c. I create forms such as questionnaires, order forms, invoices, etc. (5)
d. I take information from different sources and merge it into one document (4)
e. I create household lists and short notes (1)

- 7** The following best describes my method of writing:

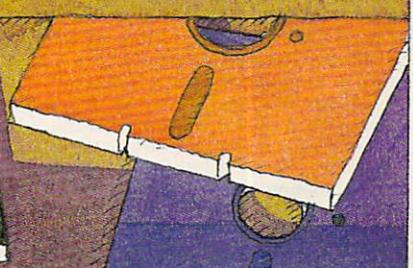
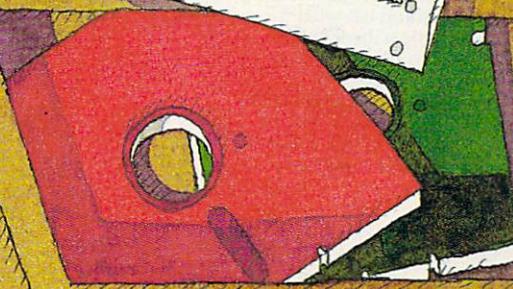
- a.** I start with an outline and then proceed to fill in the subtopics (5)
b. I write off the top of my head and then go back to correct spelling mistakes (3)
c. I write a draft copy with a pencil and paper, edit it, and then type it (1)
d. I can compose right on the keyboard and usually don't do much revision (2)
e. I write thoughts down in any order they occur to me, and then move them around to achieve an organized document (4) *(continued on page 32)*



o Holmes chucks himself.
o "When your round is a short one
o and when it is a long one you use
o As I perceive that your boots alto
o are by no means dirty, I do not doubt
o you are at present busy
o "Excellerit!" I cry.
o "Elementary, dear Watson!"



DEVIS GREBU



EDITORS' CHOICE: WORD PROCESSORS FOR FAMILY & PROFESSIONAL USE

Here's a summary of some essential terms, concepts, and facts you need to know before buying word processing software. All the packages listed have been carefully chosen by FAMILY COMPUTING editors, and we believe they're all good. Whether any particular one is good for you can be partially answered by the accompanying chart and the preceding quiz. But remember: no reading can replace hands-on experience. Make every effort possible to try out a program at a dealer or friend's house before making your purchase.

Hardware Requirements: Information listed for each word processor ("wp" will be used from here on) is based on the type of computer it was reviewed on. The statistics for other machines may, and often do, differ—especially in such areas as display mode and file size limit.

Display Mode: Indicates how many columns of text can fit on-screen, usually 40 or 80 columns. When more than one mode is listed for a wp, that display is dependent on both hardware and software. For instance, *Apple Writer* offers a separate 40-column mode for those people who don't have an 80-column card.

Horizontal Scrolling: The ability to scroll from left to right, as well as up and down. Especially useful when typing documents wider than 80 columns, or when you want to see 80 columns of text on a 40-column computer like the C 64.

Split Screen: Allows you to see two parts of a document at the same time. In programs with windowing capability (such as Microsoft Word or *XyWrite III*), more than two parts of a document or several documents can be seen at once.

Method of Operation: The way in which a program is controlled. Menu-driven means you make choices from an on-screen list; highlight "load" with a cursor key, for instance, and the file you indicate will be loaded into memory. Command-driven means you must remember to type Control-L, or some such mnemonic, in order to load a file. Some programs use both methods. For example, *Word Juggler* has a menu for disk operations, such as formatting data disks, but commands are required for moving blocks of text around or performing other editing functions.

Block Editing: Measured in characters, block editing indicates how much text you can move, copy, delete, etc. at a time.

Macros/Glossary: The macro function, also known as a glossary, allows you to automate many word processing needs. With macros you can insert your name and address at a keystroke, or reduce a time-consuming set of commands to a couple of taps of the keys.

Spell-Checker: A spelling checker may or may not be included with the wp. There are two basic types. One is a separate program that you run only after you've written your document and exited your wp. *Letter Perfect* is such a package. The other kind is available as you write and ready to "pop-up" as needed. The latest version of *PFS:Write* boasts this handy feature.

Maximum File Size: Measures how large one file—one document in memory—can be. We've measured files in double-spaced pages with average margins, approximately 1,500 characters per page.

Preview Mode: Three different possibilities here. "N," of course, means no preview mode. "Y" means that after you key in a document, a separate step will allow you to see how it will look when printed out—including details like where the page breaks will be and how the margins will appear, etc. And a new term, WYSIWYG (pronounced "wizzy-wig"), stands for "What You See Is What You Get." Even better than a preview mode, WYSIWYG gives you a close representation of what your printed page will finally look like as you write, including such extras as boldface and underlining.

Footnotes: Allows the footnote and its citation to appear on the same page.

Mail-Merge: Lets you personalize a document, such as a letter, for more than one recipient. When available in a wp, you'll find three kinds of mail-merge. With one, you make your mailing list with the wp itself, arranging names and addresses in proper order. With another, you need separate data base program to use it. And the third kind allows both alternatives; the choice is yours.

Preset Printers: The chart entry gives the number of printers supported by the word processing program. Don't worry if there's not a large number; most good programs let you set up a configuration for your printer and save it for further use. Always check a wp's manual for this compatibility question.

Copy Protected: There are two advantages to using a wp that's not copy protected. First, it's easier to install on a hard disk. Second, you can make a backup of the original, and only work with your copy. That way, should anything go wrong with the disk you use regularly, you can always make a new copy.

Documentation: Do you get just a reference manual, or a tutorial as well? And is the tutorial a book, or is it interactive?

On-Line Help: Can you call up a help screen to remind you of various commands and procedures while you're writing?

Title/Price	Publisher/Phone	Hardware Requirements	Display Mode	Horizontal Scrolling	Split-Screen
FAMILY LEVEL: DESIGNED FOR EASE OF USE					
Amiga Textcraft Plus \$99	Commodore Business Machines (215) 431-9100	Amiga.	60- and 80-column	Y	Y
AtariWriter Plus \$50	Atari Corp. (408) 745-2000	Reviewed on Atari 800. Also for Atari 800XL/130XE.	40-column	Y	N
Bank Street Writer \$50-\$80	Broderbund Software (415) 479-1170	Reviewed on C 64/128. Also for 64K & 128K Apple, IBM PC/PCjr.*	40-column	N	N
Font Master II \$50	Xetec, Inc. (913) 827-0685	C 64/128.	40-column	N	N
Jane \$50	Commodore Business Machines (215) 431-9100	C 128. Also for C 64.	40-, 64-, and 80-column	Y	N
Letter Perfect \$100	LJK, Inc. (314) 962-1855	Reviewed on 32K Atari. Also for Apple.	40-column	N	N
MasterType's Writer \$45-\$70	Scarborough Systems, Inc. (914) 332-4545	Reviewed on 128K Apple IIe/IIc. Also for C 64/128.	40- and 70-column	N	Y
PenPal \$90	Four Star Software (416) 858-7827	64K Tandy Color Computer.	42- to 54-column	N	N
Regent Word \$50	Regent Software (818) 883-0951	Atari 520ST.	80-column	N	N
Telewriter 64 \$60	Cognitec (619) 755-1258	64K Tandy Color Computer.	51-, 64-, and 85-column	N	N
FAMILY/PROFESSIONAL LEVEL: DESIGNED FOR A WIDE RANGE OF USERS AND USES					
1st Word (comes with 520ST)	Atari Corp. (408) 745-2000	Atari 520ST.	40- and 80-column	Y	Y
AppleWorks \$250	Apple Computer (408) 966-1010	Apple IIe/IIc. 128K recommended.	80-column	N	N
The Bard's Pro-Am Writing System \$70	Writing Software International (406) 543-3141	Apple IIe/IIc; 128K required for 80-column version.	40- and 80-column	N	N
HomeWord Plus \$70	Sierra On-Line (209) 683-6858	Reviewed on IBM PC/PCjr.* Also for 128K Apple IIe/IIc, C 64/128.	40- and 80-column	N	N
MacWrite \$125	Apple Computer (408) 966-1010	Macintosh.	Up to 80-column†	N	N
Mouse Word \$130	Version Soft/Int'l Solutions (408) 773-0753	128K Apple IIe/IIc. Mouse.	80-column	N	N
PaperClip \$60-\$80	Batteries Included (416) 881-9941	Reviewed on C 64. Also for Apple, Atari, C 128.	40-column (80-column w/hardware)	Y	N
PFS:Write \$125-\$140	Software Publishing Corp. (415) 962-8910	Reviewed on 128K Apple IIe/IIc. Also for IBM PC/PCjr.*	80-column	N	N
Word Juggler \$99	Quark Inc. (303) 934-2211	Apple IIe/IIc. 128K recommended.	40- and 80-column	Y	N
WordWriter 128 \$70	Timeworks, Inc. (312) 948-9200	C 128.	40- and 80-column	Y	N
PROFESSIONAL LEVEL: DESIGNED FOR WRITERS OR PEOPLE WHO PERFORM OFFICE TASKS					
AllWrite \$200	Prosoft (818) 764-3131	Tandy Models I/II/4.	64-column (80-column Model 4 only)	Y	N
Apple Writer II \$149	Apple Computer (408) 966-1010	Apple IIe/IIc.	40- and 80-column	Y	Y
Easy \$150	MicroPro International Corp. (415) 499-1200	256K IBM PC/PCjr.* Two drives.	80-column	Y	N
Leading Edge Word Processor \$99	Leading Edge, Inc. (800) 343-3436	256K IBM PC.*	80-column	Y	Y
Microsoft Word \$195-\$450	Microsoft Corp. (206) 882-8080	Reviewed on Macintosh. Also for 256K IBM PC.*	Up to 80-column†	Y	Y
Mind Reader \$65	Businesssoft, Inc. (301) 263-1962	256K IBM PC.*	80-column	N	Y
PC-Write \$75 (\$10 for trial version)	Quicksoft (206) 282-0452	IBM PC/PCjr.*	80-column	Y	Y
Volkswriter 3 \$295	Lifetree Software (408) 373-4718	256K IBM PC.* 2 drives.	80-column	Y	N
Word Perfect \$179-\$495	Satellite Software International (801) 227-4370	Reviewed on 128K Apple IIe/IIc. Also for IBM PC/PCjr.*	80-column	Y	N
XyWrite III \$395	XyQuest, Inc. (617) 275-4439	256K IBM PC/PCjr.*	80-column	Y	Y

NOTES: * Titles listed for the IBM PC/PCjr will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for exact compatibility. Unless indicated otherwise, minimum memory requirements are 48K for Apple, 48K for Atari 800 XL/XE series, 128K for IBM PC/PCjr, and 128K for Macintosh.

† Display mode on the Macintosh depends on font style: the larger the typeface, the fewer the columns that get displayed.

Method of Operation	Block Editing	Macros/Glossary	Spell-Checker	Maximum File Size*	Preview Mode	Foot-Notes	Mail-Merge	Printers	Copy Protected Documentation	Online Help	Comments
Mostly menu-driven	130,000 char.	N	N	120 pages	WYSIWYG	N	Y	20		N	Tutorial on disk, manual
Command-and menu-driven	Variable; based on free memory	N	Y	8-11 pages		Y	N	Y	7 (user can add more)	Y	Reference manual, no tutorial
Menu-driven	600 char.	N	N	10 pages	Y (page breaks only)	N	N	none (user can add one)		Y	Tutorial on disk, reference manual
Command-driven	1,280 char.	N	N	15-24 pages		Y	N	Y	74	Y	Reference manual
Menu-driven	30,000 char.	N	N	20 pages	WYSIWYG	N	N	6 (user can add one)		N	Integrated with spreadsheet and filer. Easy to use with mouse or joystick. Appropriate for simple tasks.
Command-and menu-driven	3,000 char.	N	Y	15 pages		Y	N	Y	9 (user can add more)	N	Tutorial, reference manual
Command-and menu-driven	15,000 char.	Y	N	10 pages		Y	N	N	10 (user can add more)	Y	Disk-based tutorial, reference
Menu-and command-driven	30,000 char.	N	N	20 pages		N	N	N	6	Y	Reference manual only
Command-driven	120,000 char.	N	N	80 pages		Y	N	N	18	Y	Reference manual
Command-driven	9,000 char.	N	N	12 pages		Y	N	N	4	N	Tutorial and reference manuals
Menu-driven	Entire text	N	N	160 pages	WYSIWYG	N	N	8 (user can add more)		N	Manual & tutorial on disk
Command-and menu-driven	20,000 char.	N	N	36 pages		Y	N	N	10 (user can add one)	N	Tutorial on disk, manual; reference
Command-and menu-driven	4,000 char.	Y	Y	14 pages		Y	N	N	30 (user can add more)	N	Tutorial on disk, reference
Menu-(icon) and command-driven	180,000 char.	N	Y	120 pages		Y	N	N	none (user can add one)	N	Audio tape tutorial, 2 manuals
Menu-driven	45,000 char.	N	N	60 pages + (disk-based)	WYSIWYG	N	N	2		N	Audio tape tutorial, manual
Menu-driven	15,000 char.	Y	N	30 pages		Y	N	Y	7 (user can add more)	N	Tutorial, reference manual
Command-and menu-driven	Entire text	Y	Y	26 pages		Y	N	Y	60 (user can add more)	N	Manual-based tutorial
Command-and menu-driven	5,000 char.	N	Y	16 pages		Y	N	Y	17 (user can add one)	Y	Reference manual
Command-and menu-driven	20,000 char.	N	Y	40 pages (w/128K)		Y	N	Y	30	Y	Tutorial, reference manual
Menu-and command-driven	32,000 char.	N	Y	40 pages		N	N	Y	20 (user can add one)	Y	Will accept data from <i>SwiftCalc 128</i> and <i>Data Manager 128</i> . Can chain files for longer documents.
Command-driven	Variable; based on free memory.	Y	Y	Up to disk capacity		N	Y	Y	3 (user can add more)	N	Reference manual, tutorial
Command-driven	1,024 char.	Y	N	20 pages (more w/128K)		Y	Y	Y	2 (user can add more)	N	Disk & manual tutorial, reference
Mostly menu-driven	750 char.	N	Y	Up to disk capacity		Y	N	N	112	N	Tutorial on disk, reference manual
Menu and command-driven	256 char.	Y	N	Up to disk capacity	WYSIWYG	N	Y	28 (update disk available)		N	Tutorial, reference manual
Menu-driven	Entire text	N	N	Up to disk capacity	WYSIWYG	Y	Y	8		Y	Manual, tutorial
Menu-driven	Variable; based on free memory	Y	Y	30 pages		Y	N	Y	2	Y	Reference manual
Command-and menu-driven	6,000 char.	Y	N	40 pages		Y	Y	Y	280	N	Manual-based tutorial, reference
Command-and menu-driven	Variable; based on free memory	N	Y	240 pages (w/360K drive)	WYSIWYG	N	Y	81		N	Tutorial on disk; manual
Command-driven	90 pages + (disk based)	Y	Y	90 pages + (disk-based)	WYSIWYG	Y	Y	Y	91	N	Complete tutorial in manual, reference
Command-driven	60,000	Y	N	Up to disk capacity		Y	Y	Y	100 (update disk available)	N	Tutorial, reference manuals

*File size measured in double-spaced pages.

- 8** I intend to use my word processor:
- a. As a stand-alone piece of software to write and print out documents (1)
 - b. To ship files over phone lines to another person (2)
 - c. Along with a graphics program to incorporate pictures and text (4)
 - d. With a "mail-merge" function to create large mailings (3)
 - e. Along with a spreadsheet so I can do calculations and comment on the results with text (5)
- 9** The following best describes what I'd like the screen to look like before I print out:
- a. I want to see exactly how my document will look before I print it (underlined words should be underlined on-screen, etc.), even though the formatting process may take some time and effort (5)
 - b. I can tolerate formatting commands on-screen with the text, like ".U" for underline or ".B" for bold-face (3)
- c.** I don't need to see my formatted document on screen. I'll simply print the document and then go back and fix it if it doesn't look right (2)
- d.** I don't intend to use boldface, underlining or centering, so formatting commands aren't an issue (1)
- e.** I want to get a general idea of overall length, where the page breaks will occur, and how wide the margins will be (4)
- 10** Extra attractions I'd like to see in my word processor would be (check all that apply):
- a. A word-count function (1)
 - b. A spell-checking function (1)
 - c. A mail-merge function (1)
 - d. A way to do indexing automatically (1)
 - e. A way to give an automatic sequence of often used commands or phrases (macros) (1)
- 11** Almost all word processors can "search" and "replace." For example, they can search for the word "kids" and replace it with "children."

WHERE DOES YOUR SCORE PUT YOU?

FAMILY (15-30 Points)

(Designed for Ease of Use)

If you want a word processor to compose short letters, brief reports, school papers, club mailings, or for general household listmaking, you don't want or need the world's most complex program. And, if you're going to use the program infrequently, you want to make sure you don't have to re-learn the system every time you want to jot down a note. A clean, simple family word processor is for you.

Family word processors are first of all easy to use and are designed for people who don't write regularly or professionally. The programs are menu-driven, which means you don't have to memorize a lot of commands. Despite their ease of use, the programs include all the major word processing functions, like search and replace, cut and paste, insert and delete, etc. Thus, you can use these word processors to accomplish professional tasks as well.

FAMILY/PROFESSIONAL (30-45 Points)

(Designed for Wide Range of Users and Uses)

Some word processing programs are easy enough to be used by novices or infrequent users, but have enough features and are fast enough to work for professionals. Instead of using just menus, which are easy but slow down the user, or just commands, which allow speed but take time to learn, these crossover programs often mix menus and commands. Pop-up menus, which you can make appear and disappear as you wish, exemplify this new style of program. Some programs have extra features, such as a spelling checker, and can be used with equal effectiveness by children and parents, home users and office workers.

PROFESSIONAL (45-75 Points)

(Designed for Writers and People Who Perform Office Tasks)

Writers, professionals, business people, college students, academics, and others who write regularly want a program that will allow them to write effortlessly. Professional programs are fast and responsive tools designed to streamline the writing process. They're full of writer-friendly features, such as spelling checkers, automatic footnoting, macro functions, and built-in communications to send files.

The greater the page-formatting ability, the better the program is for businesses that generate lots of paper—memos, letters, reports, client presentations, etc. If you run a business, or are doing office work at home, you probably want a word processor that is designed to create a wide variety of printouts. The higher your score, the more you need print-format control. With such a program, you can break a document into pages to see where text will fall; automate certain repetitive writing tasks; use special decimal TABs to arrange dollar-and-cents figures in columns, and more.

Professional programs usually require that you learn commands, though some use a combination of menus and commands. These complex programs take time to learn, and even experienced users often resort to reference manuals. But if you require the control they give, you'll save time in the long run with a professional-level word processor.

Editor's note: Part 2 of our "Guide to Writing" will appear next month. It will focus on enhancement programs (such as spelling checkers, grammar checkers, and thesauruses) that are designed to be used with your word processing program.

How would you like your search-and-replace function to work?

a. Stop at each occurrence of a given word, and ask if I want to look for the next (1)

b. Automatically search and replace each occurrence of a given word in the whole document (2)

c. Search and replace "wildcards," such as every single number in a document (4)

d. Search and replace that differentiates between upper and lower case letters (i.e. "Chapter" versus "chapter") (3)

e. All of the above are important (5)

12 Would you rather use a program that:

a. Has easy-to-use menus, but is slow (1)

b. Does everything under the sun, but has so many different types of commands you need "cheat sheets" on your desk (5)

c. Is fast if you know the program, but requires you to memorize commands (4)

d. Has pop-up (or pull-down) menus that work slowly, but require no memorization (2)

e. Uses a combination of menus and memorized commands (3)

13 I'd pay extra to be able to (check all that apply):

a. Delete a whole word at once (1)

b. Set a line length longer than 80 characters, for charts and tables (1)

c. Automatically create a table of contents (1)

d. Perform minor mathematical calculations (1)

e. See different parts of a document (beginning and end, say) at once (split-screen) (1)

14 When I print a document I'd like to (check all that apply):

a. Underline and boldface words for emphasis (1)

b. Center titles (1)

c. Use automatic page numbering (1)

d. Use headers (such as your address at the top of each printed page) and footers (such as the date at the bottom of each page) (1)

e. Generate automatic footnotes (1)

15 When setting margins I'd want to (check all that apply):

a. Set justified text (flush left and flush right) (1)

b. Set left and right margins the same for the entire document (1)

c. Control the minimum length of a "widow" (a short word on a line by itself) or "orphan" (a short line at the top of a page) (1)

d. Use mixed margin settings within the same document (1)

e. Have a special decimal tab to align columns of numbers (1) 

Great Programs For \$25 and Under

YOU DON'T NEED TO SPEND BIG BUCKS
FOR SOFTWARE
IF YOU HAVE A GOOD EYE
FOR VALUE

BY JUNE
ROGOZNICA

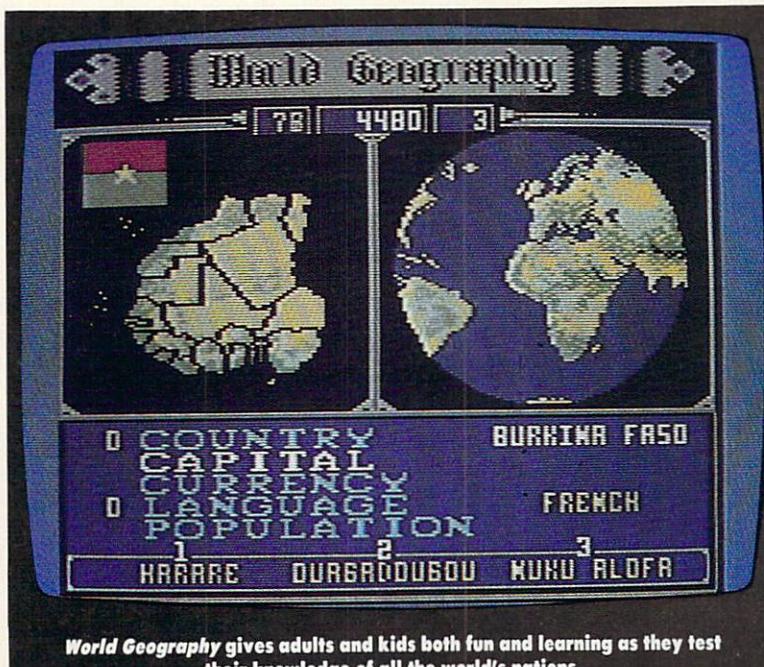
Purchasing a computer is a hefty investment. In fact, after a house and an automobile, it could very well be the next most expensive item you'll buy in your lifetime. As time goes on and you add peripherals and software to your stash of technological treasures, you could begin to feel computer-rich and cash-poor.

For the discriminating shopper, that needn't be true, especially where software is concerned. If you shop wisely, you can find an abundance of low-priced programs that will perform many of the same functions as more expensive packages, albeit with fewer features. Whether the task is word-processing, home budgeting, or math drill-and-practice, chances are there's a good deal waiting to be found for your machine.

Where are these good deals? In general, you'll have to search a little further to find them. Many packages are available directly through the manufacturer or via mail order; the wealth of articles and ads in computer magazines are one source of information. A good software dealer should be able to tell you about the reputable companies that produce software for your machine, and he'll often have catalogs that contain product descriptions. It's also a smart idea to check out your local mass marketer, such as K-Mart, Sears, or Toys 'R' Us.

When you buy low-priced software, be prepared for what you won't receive as well as what you will. In general, you won't get a program wrapped in slick packaging. Nor will you find a glossy, thorough manual. For the most part, written instructions will be brief or sometimes nonexistent, with on-screen directions frequently serving as your only guide. What you *will* get is software that does a better-than-adequate job of meeting your needs.

We've selected a sampling of the programs we consider great values for your dollars and limited the packages



World Geography gives adults and kids both fun and learning as they test their knowledge of all the world's nations.

to those priced at \$25 or less. We've selected a few games, but for the most part we've concentrated on home business, productivity, and educational packages that would normally carry higher price tags.

(Editor's note: As with all software, check the warranty and backup policies before you make a purchase.)

EDUCATION/FUN LEARNING

Countries, Capitals, and More (IBM Personally Developed Software). Detailed graphics and multiple-choice questions make this a great geography

game for adults as well as children. Choose from three different gaming approaches. First, in the "selection" game, you're asked to identify the name of a body of water, country, etc. highlighted on the on-screen map. Second, the "comparison" game asks you to choose the larger of two countries in terms of area, population, or population density. In this section, the program not only determines the accuracy of your answer, but also displays the actual statistics. Third, in the "location" game, you're asked to show the location of a particular country by use of the arrow keys. For example, you may be asked to point out Tanzania on a divided map of Africa. A tutorial section provides the information on countries used in the game.

Learning to Add & Subtract (Learning Technologies, Inc.). Designed for ages four to eight, this software uses graphics (bunnies, grasshoppers, buses, etc.) to teach children to solve addition and subtraction problems with numbers from 0 to 9. There's no time limit to answer the problems, and children are always given the opportunity to try again with help phrases ("try a lower number") or visual clues (two bunnies hopping away from a group of five to signify the equation 5 minus 2). The program is divided into addition and subtraction sections, so you can have your child work on the weaker of the two areas.

JUNE ROGOZNICA is a freelance writer. Like most freelancers, she knows how to find a good value.

Letterfall (Frank Harris). This program can help just about anyone—from beginner to advanced—improve their typing speed and accuracy, and have fun at the same time. There are 16 levels of practice, starting with use of the home keys, to the more difficult level of typing numbers and capital letters. Each level is divided into two sections. In the first practice drill, letters fall down from the top of the screen and your challenge is to type the proper key before the falling letter hits the bottom of the screen. In the second section, words replace letters. If you make an error, the computer gives you immediate feedback by beeping, so you can correct your error and avoid picking up bad typing habits. At the end of each level, *Letterfall* displays your typing speed, the number of errors, points out errors with specific keys, and lets you practice the drill again. Names of the top 10 scorers are kept so the whole family can track their progress.

Number Bowling (Scott, Foresman and Company/Mindscape). One of the Math Action Game Series, this program is designed to help children in grades 6 through 8 improve their fraction and decimal skills. The game is highly motivational, encouraging speed as well as accuracy in answering math problems. Points are awarded according to the quickness of the player's response. For example, you receive 10 points if you answer within two seconds and zero points for more than 60 seconds. Once the problem appears on the screen (example: give $6 \frac{3}{4}$ as a fraction), the timer begins. When you answer correctly, a bowling ball rolls down a simulated alley and knocks down the number of pins that represent your score. If you answer incorrectly, you will have the opportunity for a second try.

World Geography (BOBCO). Kids and adults will enjoy this program for hours and hours. Colorful animation and lively music serve as background for this game designed to test your knowledge of America, the Pacific, Eurasia, and Africa. You're asked to identify a country by its flag, then to identify the country's capital, currency, language, and population from a multiple-choice selection. You play against the clock, and the level of play you choose—beginner, intermediate, or expert—determines

the speed of the timer. With 175 countries in the game, you'll spend some time mastering the answers. After all, did you know that the currency of Africa's Malawi is the Kwacha and the official language is English?

Creative Fun

CardWare (Hi Tech Expressions, Inc.). Tired of sending the traditional birthday card? With *CardWare*, you can design and print out an original card with a celebratory graphic on the front and a personalized message inside. Or, if your friend has the same type of computer, create your message on a disk and let him or her boot up your greeting. Of course, birthdays aren't the only holidays you'll want to remember; don't forget Mother's Day, wedding anniversaries, Graduation Day, etc. *CardWare* is part of the WareWithAll line of software.

Kwik-Paint! (Datamost). Graphics programs are always popular; *Kwik-Paint!* lets you or your child become an electronic artist at the first sitting. With a joystick or a

KoalaPad, you can choose from 16 different colors to create a picture using lines, boxes, circles, rays, or points. The program has a wide assortment of features: four different patterns (a pure color, a checkered pattern, horizontal lines, and vertical lines), eight drawing speeds, and a "magnify mode" for details.

Music Painter

(Atari Corp./Carousel Software, Inc.). If you've ever dreamed of composing your own tunes but never quite had the musical acumen, *Music Painter* can give you the right tools to get you to center stage—even if the

stage is only your own back porch. It's easy enough to "paint" your own music, using icons or pictures to guide you through the process. You can choose any or all of four instruments (piano, flute, drums, and violin) and three different voices. Finally, you can save your masterpiece for entertainment at family gatherings. The program teaches you basic music vocabulary, such as scale, staff, sharps, flats, and tempo.

GAMES

Action Biker (Mastertronic). The advanced gamer may consider this game a bit primitive graphically and

SOFTWARE DEALS & THE DEAL MAKERS

Action Biker. Mastertronic, (301) 695-8877. C 64/128; \$10. **CardWare.** Hi Tech Expressions, Inc., (305) 854-2318 & (800) 848-9273. 64K Apple & 256K IBM PC/PCjr on one disk; Atari & C 64/128 on one disk; \$10. **Color File.** Tandy Corporation, (817) 390-2728. Tandy Color Computer; \$20. **Countries, Capitals, and More.** IBM Personally Developed Software, (800) 426-7279. IBM PC/PCjr; \$25. **FlightSim I.** Tandy Corporation, (817) 390-2728. Tandy Color Computer; \$25. **Instant Recall.** Mastertronic, (301) 695-8877. C 64/128; \$15. **J Writer.** Green Valley Publishing/ShareData, (612) 829-0409 & (800) 328-6061. Apple; \$7. **Kwik-Calc!** Datamost, (818) 709-1202. C 64/128; \$20. **Kwik-Paint!** (Same as above.) **Learning to Add & Subtract.**

Learning Technologies Inc., (214) 991-4958. Apple, C 64/128; \$20. **Letterfall.** Frank Harris, P.O. Box 69457, Station K, Vancouver, B.C., Canada V5K 4W6. 64K Apple, IBM PC/PCjr; \$25.

Music Painter. Atari Corp., (408) 745-2000. Atari 800/XL/XE series; \$20. **My Calc.** Computer Easy, (602) 829-9614 & (800) 522-3279. IBM PC/PCjr; \$20. **Number Bowling.** Mindscape, (312) 480-7667 & (800) 221-9884. Apple, C 64/128; \$20 (C 64); (\$30 for Apple). **Plan-A-Year.** IBM Personally Developed Software, (800) 426-7279. IBM PC/PCjr; \$25. **Trial Size Toolbox.** Roger Wagner Publishing, (619) 562-3670. 64K Apple; \$3. **Windows.** St. Mars Systems, Inc., (305) 671-2516. C 64; \$25. **World Geography.** BOBCO (408) 462-1551. C 64/128; \$25.

limited in terms of challenge, but novice players will find *Action Biker* and a host of other titles (*The Gates of Dawn*, *Master of Magic*, and *The Slugger* to name three more) well worth the rock-bottom prices. In *Action Biker*, you weave your way around a course in search of a turbo charger and electric starter or perhaps "speed" stripes, all to help you get to the drag race. You'll need to be adept at handling a joystick and at deciphering nearly nonexistent instructions. A map is included to help plot your course, but beware of the lake, a brick wall, and other obstacles that might lead to a major mishap.

FlightSim I (Tandy Corporation). Much more than a game, this simulator (used in flight training programs) will teach you a bit about aerodynamics as well as physics and meteorology. You'll learn about the interaction between the wind and the wing, the forces of lift and drag, and the effect of atmospheric pressure. With this information tucked under your pilot's cap, you'll board your jet and attempt to take off, fly, and land safely. Your computer's screen is divided into two sections, with the control panel on the bottom half and the view from the cockpit on the top half. You use two joysticks to guide the jet to a happy landing.

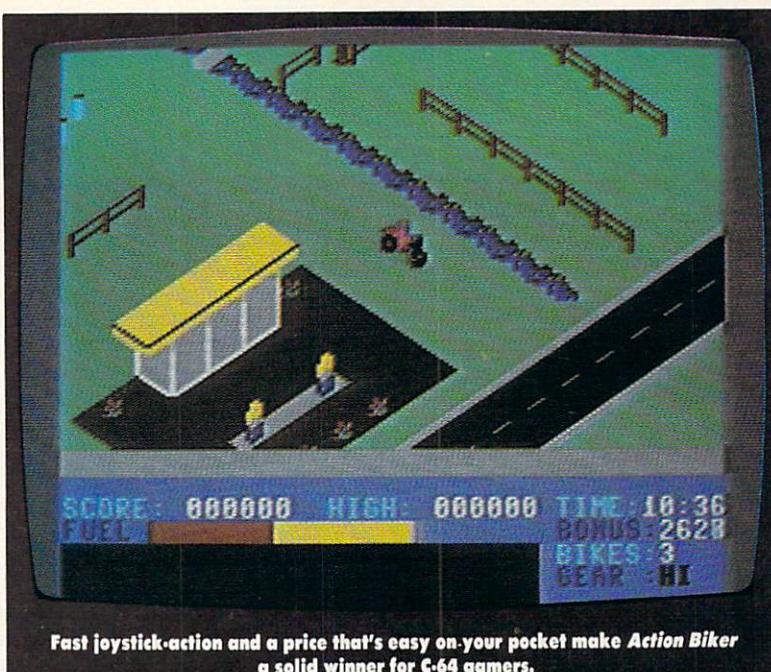
HOME BUSINESS & PRODUCTIVITY

Color File (Tandy Corporation). An easy-to-use data base, *Color File* is set up with seven pre-defined files (for addresses, warranties, home inventory, investments, car maintenance, medical history, and resumé/vita) and the option to define your own files. The program, however, is not designed to handle

lengthy files; it's limited to only seven fields in each record. You can search for specific alphabetic or numeric fields and sort records in ascending or descending order.

Instant Recall (Mastertronic). This easy-to-use electronic filing system has limited features and capacity, but will clearly suit the needs of users with short mailing lists or directories. Each data base holds approximately 300 records of 100 characters each. The program lets you create up to 15 fields per record. Search your data base by record number, field name, specific names of items (i.e. "Brownie" for a mailing to the girl scouts), or use wild cards. Single key commands, such as "F" (forward) and "B" (back), let you browse through your records in either direction.

J Writer (Green Valley Publishing). All the instructions are provided on disk, and you can print them out into a reference manual. The program is a bit awkward, with CONTROL keys used for on-screen editing; for example, CONTROL-F defines a search string and CONTROL-D deletes character at cursor. Still, you have ample features and printer commands (including headers/footers and centering) to word-process a letter or a term paper. *J Writer* is part of the Load 'N' Go Series, which offers over two dozen programs for the C 64 and over three dozen for the Apple, including a monthly budgeter, a personal spreadsheet, and games packages.



Fast joystick-action and a price that's easy on your pocket make *Action Biker* a solid winner for C-64 gamers.

Kwik-Calc! (Datamost). Whether you hold the purse strings for your family or run a small business at home, *Kwik-Calc!* has the features you'll need to balance the books. As with all spreadsheets, you can use the program to do home budgeting, set up business profit-and-loss statements, or simply play "what-if" games. The 24-page instruction manual is more comprehensive than most for programs in this price range. It comes with three models or spreadsheet templates: costs for gas and electricity, a stock portfolio analysis for tracking securities transactions, and a rental income analysis for owners of investment property. You can type in these models or set up your own. Like *Kwik-Paint!*, this program is part of the Kwik-Ware Series, which includes a word processing program, a spell checker, and a menu-driven data base.

My Calc (Computer Easy). An electronic spreadsheet, *My Calc* has a thorough on-screen tutorial that demonstrates the software's capabilities. Entering data is fairly easy; you can enter a label, a number, or a formula. The program will update automatically when you change the value that's part of a formula; you can also turn off the update command. On a 128K computer, there are about 4,000 entries available, and *My Calc* will warn you when there's about 10 percent of the space left. Information can be printed out in standard column format or as a horizontal bar graph. Computer Easy also has educational programs for the IBM, Apple, and C 64/128 computers.

Plan-A-Year

(IBM Personally Developed Software). Mapping out your house-

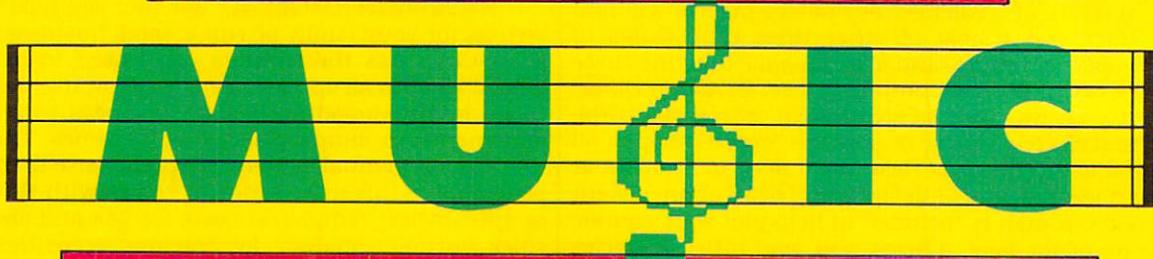
hold's financial strategy is never an easy task, but *Plan-A-Year* will certainly help you get a running start. Track your special accounts (i.e. CD, savings, vacation fund), and your income and expenses for 15 different categories that have been set up in the demonstration model, or set up your own. You'll be able to determine your finances on a month-by-month basis.

UTILITIES

Trial Size Toolbox (Roger Wagner Publishing). When you want the power and speed of assembly language, but you can program only in Applesoft BASIC, try The Toolbox Series. I mean really try it out with the *Trial Size Toolbox*. Not a demo, this disk contains 19 fully functional new commands that you can add to your own BASIC programs. *WINDOW* lets you put different text windows in your program, *TONE* generates a pure tone, and *CHART* makes it easy to create graphs.

Windows (St. Mars Systems, Inc.). Ever dreamed of owning a Macintosh, but not quite ready to give up on your Commodore 64? Well, this screen processor utility gives you windowing capabilities for BASIC or assembly language programs. Of course, the advantage of windows is that you are no longer limited by the size of your monitor's screen. You define the location and size of your windows, with no limit on the number of windows. **FC**

1986 BUYER'S GUIDE TO



HARDWARE AND SOFTWARE

REGARDLESS
OF MUSICAL TALENT,
YOUR FAMILY
CAN MAKE BEAUTIFUL MUSIC

BY JOEY LATIMER

Larry Dunlap, a 37-year-old oil worker from Houston, Texas, uses his family's Apple II+ computer in his spare time to compose and listen to music. When Dunlap loads the software that turns his computer keyboard into a "piano," his one-year-old daughter, Alder, often presses the computer keys and is delighted by the music it makes.

Jim West, 53, of San Diego, California, is an electronic design engineer by day and jazz musician by night. West has connected an electric piano keyboard, a drum machine, and other equipment to his IBM PC. His goal is to use his computer and some additional hardware to imitate a jazz quintet, complete with piano, bass, drums, flute, and vibraphone.

Although their ages and musical abilities are quite different, the Dunlaps and West are using their computers for the same exciting applications: to experiment, learn about, and have fun with music.

Whether you're a music student, a virtuoso, a Sunday composer, a person who dabbles in music, or someone who just likes to listen, there's something for you in FAMILY COMPUTING's "1986 Buyer's Guide to Music Hardware and Software." We've included information on a wide range of music products, from recording software to music-skills programs to plastic keyboards. To help you and your family find the right computer-music products, there are comparison charts of music software and hardware, as well as a round-up of the built-in sound and music capabilities of most popular computers. You'll also find an exclusive interview with singer and songwriter Barry Manilow, who reveals how he first got involved with computers, what he's doing to progress, and some of his feelings about computers and music. FAMILY COMPUTING hopes to help your family bring beautiful music into your home.

COMPUTERS ARE MUSICALLY TALENTED

It's no mystery why computers and music are such perfect companions: Computers can remember and store all types of information, including musical data, which can later be recalled; computers are equipped with built-in clocks and timing features making it easy to keep track of musical time; computers can hook up to printers, which are handy for printing music; and computers

can be connected through interfaces to musical instruments and other computers, which means that musical information can be sent from computer to computer, instrument to computer, and computer to instrument. Thus your computer is an ideal tool for composing, recording, storing, printing, and sending or receiving music. As for musical novices, the computer is a great tool for experimenting. Its never-ending patience makes it a great "drill instructor" for music practice and learning.

As you may know, most computers can play music and make sound effects without special hardware—as long as they have built-in "sound chips." A sound chip is an integrated circuit in your computer, capable of playing musical notes. Sound chips vary greatly in the number of voices—or musical parts—they can play at the same time and in the range of pitches, from low notes to high notes. Many computer sound chips can also produce "white noise," which sounds similar to steam escaping. It can be manipulated to make sound effects such as bombs, crashes, wind, and thunder, or to distort pure tones for special effects.

The following round-up describes the built-in music capabilities of most popular computers to help you determine if your computer is naturally a musical gem, or if it could use add-on hardware to give it a musical boost.

Apple II+, IIe, IIc: no sound chip; one voice; tiny speaker is built into each keyboard; range of tones can be produced using special software; IIc has a volume control feature. (*Note: This month's Programmer section includes Apple Harmony, a program that gives the Apple II series three voices.*)

Apple Macintosh: internal sound chip; up to four voices; capable of advanced sounds; sounds can be sent to external stereo speakers; music can play in background while the computer executes a BASIC program.

Atari 520 and 1040 ST: internal Yamaha synthesizer chip; three voices; capable of advanced sound synthesis; built-in MIDI ports for connecting to MIDI instruments and other computers. (*See "Midi: The Link to the Music World," below.*)

Atari 400/800, 600/800/1200XL, 65/130XE: internal sound chip; four voices, each capable of producing pure tones as well as white noise and distortion; eight-octave (eight-note scale) sound range; audio cable from monitor can plug into a stereo for improved sound.

Coleco Adam: internal sound chip; three voices, each

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capable of producing pure tones as well as white noise and distortion; can be programmed to play a wide range of sound effects; six-octave sound range.

Commodore Amiga: internal sound chip; up to 16 voices; capable of highly advanced sound and voice synthesis; nine-octave sound range; can reproduce and modify sounds taken from the real world.

Commodore 64/128: internal sound chip; three voices, each capable of producing pure tones as well as white noise and distortion; includes advanced features for creating and modifying instrument sounds and special effects; eight-octave sound range; audio cable from monitor can plug into a stereo for improved sound.

IBM PC & compatibles: no sound chip; one voice; advanced features in Advanced BASIC make music programming easy (PLAY language); sound plays through small internal speaker.

IBM PCjr and Tandy Model 1000: internal sound chip; three voices; advanced features in PCjr Cassette BASIC make music programming easy (PLAY language); music can play in background while the computer is executing a BASIC program.

Tandy/Radio Shack TRS-80 Color Computers: internal sound chip; one voice; four-octave sound range; options are limited to setting notes, pitch, and duration.

HARDWARE BEEFS UP YOUR COMPUTER

Although your computer can make music on its own, you can really bring exciting and powerful music features into your computer system by adding music hardware. In the accompanying music hardware chart, we've included add-on keyboards and MIDI interfaces. Add-on keyboards are input devices (like joysticks) which either lie on top of your computer's keyboard or look like small piano keyboards that plug into a user port, cartridge port, or slot on your computer. MIDI interfaces let you connect MIDI-equipped instruments to computers.

MIDI: THE LINK TO THE MUSIC WORLD

MIDI, which stands for Musical Instrument Digital Interface, is a foreign term to the average opera fan or guitar strummer. But if you decide to plunge into the world of computer-generated music, you'll want to know about it. MIDI is a common interface through which many makes and models of musical instruments can be connected. It's also a standardized way to connect electronic musical instruments to your computer. For example, a MIDI interface makes it possible to link your Commodore 64 to a Casio keyboard. This keyboard can be told by your computer when and what to play: Your computer will do things like compose and store music and print scores, while the Casio actually plays the music.

With the exception of the Atari ST and the Yamaha CX5M Music Computer (sold in music stores), computers don't have built-in MIDI interfaces. They usually come in the form of plug-in cards, cartridges, or boxes. Some enable you to hook up more than one MIDI instrument at the same time so you can simulate an orchestra right in your living room. (For more information on MIDI, you can write the International MIDI Association at 11857 Hartsough St., North Hollywood, CA 91607 or call [818] 505-8964.)

As you can see by the accompanying hardware chart, there are many add-on hardware products that can really beef up your computer and give your family some exciting possibilities for music making. (Note: While there are scores of MIDI pianos, organs, synthesizers, drum machines, and other MIDI instruments available, we have only listed a few of them. If your family is thinking about buying a MIDI instrument, you should visit a music store.)

SOFTWARE BRINGS IT ALL HOME

Regardless of the music hardware your computer system has, it can't do anything without software. But, with the right software, your family can listen to and sing along with popular songs, record new ones, print scores, create custom instrument sounds, practice note recognition, and more. Software brings it all home and puts musical power at your fingertips.

Composing, performing, and sound-shaping software—the first section of this chart—consists of programs used for recording, composing, music editing, score printing, creating and changing instrument sounds, and more. To help you see whether a program has the features you are looking for, we have printed a "Y" or "N" in the chart under the following categories:

Creates Instrument Sounds: A "Y" in this column lets you know that this program can instantly create and change instrument sounds to suit your needs. This is usually done by changing settings on the screen and listening to the results.

Saves/Loads Sounds: A "Y" in this column means that the program will save and load sound information, so that the user can save different instrument sounds for later use. Once sounds have been saved, they can be reloaded and used in future performances and playbacks.

Records: A "Y" in this column indicates that this program will record your performances "live," and then let you play them back.

Sequences: Sequencing (composing music on the computer screen one note at a time) is an alternative to recording "live" performances. The most popular way to sequence is to use a joystick, mouse, or cursor keys to move musical notes and symbols onto musical staves, which are printed on the screen. Sequenced scores can be played back, saved on disk, or used to control MIDI-equipped instruments.

Saves/Loads Music: When you have finished recording or sequencing music, a "Y" in this column means that you can save it on disk.

Prints Scores: A "Y" here means that you can print sheet music if you have a compatible printer with graphics capabilities.

MIDI Compatible: If you want software that will work with a MIDI interface and MIDI-compatible instruments, look for a "Y" in this column.

The educational section of the music software chart will be most useful for families who lack the musical expertise of the Jacksons. If your musical prowess is limited to knowing the lyrics of Top 40 songs, these programs can help. Included are musical games, drill-and-practice programs for sight reading and ear training, a sound-synthesizer tutorial, instructional guitar programs, and more. Educational music programs have a category heading for "learning level" to let you know approximately at what level a person should be musically before attempting to use the program.

GET THE FAMILY IN TUNE

Now you have the information you need to start building or adding to a family music studio. As you can see by our software charts, dabbling in music doesn't have to be expensive or complicated. There are plenty of programs under \$50 that you can slip into your disk drive to start experimenting with and composing music. And if you're a serious musician, a set-up complete with MIDI instruments, interfaces, and software will cost substantially more, but its music potential will be boundless. So what are you waiting for? Take off your Walkman and fire up your computer. It's time to make your own music.

MUSIC SOFTWARE



Company Name, Address, Phone	Product Name and Cost	Description and Comments	Hardware Required	Ease of Use	Create Inst	Save Sounds	Records	Sequences	Save Music	Print Scores	MIDI Comp
COMPOSING, PERFORMING, AND SOUND-SHAPING SOFTWARE											
Access Software Inc. 2561 S., 1560 West Woods Croft, UT 84087 (801) 298-9077	MASTER COMPOSER \$40	Music-composition tool with sound shaping. ¹ Notes are entered on a screen similar in appearance to sheet music.	Commodore 64/128	average	Y	Y	N	Y	Y	Y	N
Activision 2350 Bayshore Frontage Road Mountain View, CA 94043 (415) 960-0410	THE MUSIC STUDIO \$50 (IBM) \$60 (Amiga) \$35 (Atari)	Colorful tool kit for creating songs and sounds. Screens feature icons and a pointing wand.	Amiga; Atari ST series/800; Commodore 64/128; IBM PC; Tandy 1000; joystick or KoalaPad.	easy	Y	Y	N	Y	Y	Y	Y
Broderbund 17 Paul Drive San Rafael, CA 94903 (415) 479-1170	THE MUSIC SHOP (non-MIDI version) \$45	User-friendly program makes it easy to move notes on and off a musical staff, as well as shape instrument sounds.	Commodore 64/128; joystick.	easy	Y	Y	N	Y	Y	Y	N
ComputerWare P.O. Box 668 Encinitas, CA 92024 (619) 436-3512	SYNTHER 77 \$28	Turns keys into piano keys covering any two octaves over a twelve-octave spread.	32K TRS-80 Color Computer	easy	Y	Y	Y	Y	Y	N	N
Creative Solutions 4701 Randolph Road, #12 Rockville, MD 20852 (301) 984-0262	STUDIO MAC \$125 \$214 w/MIDI adapter \$495 w/Casio keyboard, MIDI adapter & stereo cable	Powerful sequencer ² and sound shaper lets you change orchestration in the middle of a song. Also includes cut-and-paste features.	128K Macintosh; cable for connecting Macintosh to stereo.	average	Y	Y	N	Y	Y	N	Y
Electronic Arts 2755 Campus Drive San Mateo, CA 94403 (415) 571-7171	MUSIC CONSTRUCTION SET \$23 (Commodore & Atari) \$40 (Apple & IBM)	Lets you move notes and other musical symbols onto a high-resolution musical staff. Uses icons for easy learning and quick results.	48K Apple; 48K Atari; Commodore 64/128; IBM PC/PCjr; Macintosh	easy	N	N	N	Y	Y	Y	N
	DELUXE MUSIC CONSTRUCTION SET \$46	Mouse-operated composing tool. Includes support for lyrics, guitar notation, different fonts, and many advanced musical options.	128K Macintosh; mouse; MIDI- compatible instrument; MIDI interface and cables.	easy	Y	Y	N	Y	Y	Y	Y
EnTech Software P.O. Box 185 Sun Valley, CA 91353 (818) 768-6646	STUDIO 64 \$40	Converts computer keyboard into piano keys. Lets you assign more than one instrument to each note.	Commodore 64/128	easy	Y	Y	Y	Y	Y	N	N
Firebird Software 74 N. Central Ave. Ramsey, NJ 07446 (201) 934-7373	THE CONCISE MUSIC SYSTEM \$40	Contains sequencer and sound-shaper programs. Screen contains windows and pull-down menus for easy operation.	Commodore 64/128	average	Y	Y	Y	Y	Y	N	N
	THE ADVANCED MUSIC SYSTEM \$80	Similar in appearance to <i>The Music System</i> . Also includes MIDI features, printer capabilities, and file-linker program.	Commodore 64/128	average	Y	Y	Y	Y	Y	Y	Y
Future Vision P.O. Box 34-FC N. Billerica, MA 01862 (617) 663-8591	VIDEO TUNES \$35	Songs can be composed and entered by using a joystick to place notes on a musical staff.	Adam; joystick.	average	N	N	N	Y	Y	N	N
Great Wave Software P.O. Box 5847 Stanford, CA 94305 (415) 325-2202	CONCERTWARE + \$70 CONCERT- WARE + MIDI \$140	Music Writer, Instrument Maker, and Music Player make up this package. Turns your Mac into an electric organ.	Macintosh; mouse.	average	Y	Y	Y	Y	Y	Y	N
Hayden Software 600 Suffolk St. Lowell, MA 01854 (201) 393-6319	MUSIC WORKS \$80	A program that gives you two ways to enter music. You can use a conventional staff or a system of putting symbols on a grid.	Macintosh; mouse.	average	Y	Y	N	Y	Y	Y	N
Melodian Inc. 115 Broadway, Suite 1202 New York, NY 10006 (800) 327-4566	CONCERT MASTER \$30	Synthesizer ³ /recorder ⁴ program. While playing, you can see the notes on a colorful musical staff.	Commodore 64/128	average	Y	Y	Y	N	Y	N	N
Mindscape Inc. 3444 Dundee Road Northbrook, IL 60062 (800) 221-9884	BANK STREET MUSIC WRITER \$30 (Commodore 64) \$150 (Apple w/Mockingboard) \$50 (Apple w/o Mockingboard) \$150 (IBM PC w/Mockingboard) \$50 (IBM PCjr - no board required)	Easy-to-operate program that lets you compose and play music. Works with Mockingboard that allows you to play up to six voices.	48K Atari 800; Commodore 64/128; 48K Apple; IBM PC/PCjr	easy	Y	N	N	Y	N	Y	N

¹sound shaper: program for changing sounds. ²sequencer: program for arranging music. ³synthesizer: produces and controls sound. ⁴recorder: program that captures performances in real time (live).

MUSIC SOFTWARE



Company Name, Address, Phone	Product Name and Cost	Description and Comments	Hardware Required	Ease of Use	Create Inst	Sav/Ld Sounds	Records	Sequences	Seq/Ld Music	Seq/Ld Scores	Print Scores	MIDI Comp
COMPOSING, PERFORMING, AND SOUND-SHAPING SOFTWARE (continued)												
Passport Designs 625 Miramontes St., No. 103 Half Moon Bay, CA 94019 (415) 726-0280	THE MUSIC SHOP (MIDI version) \$150	User-friendly program makes it easy to move notes on and off the "sheet music." Pull-down menus make it one of the easiest MIDI programs to learn.	Commodore 64/128; joystick, MIDI-compatible instrument; MIDI interface and cables.	easy	N	Y	Y	Y	Y	Y	Y	Y
Scarborough Systems 55 S. Broadway Tarrytown, NY 10591 (914) 332-4545	SONGWRITER \$20	A simple program for creating and storing melodies and songs.	48K Apple; 48K Atari; Commodore 64/128; IBM PC (needs color/graphics adapter) PCjr.	easy	Y	Y	Y	N	Y	N	N	
Sight & Sound Music Software 3200 S. 166th St. P.O. Box 27 New Berlin, WI 53151 (800) 558-0910	MUSIC PROCESSOR \$25	A recording/performance/playback package, including a piano mode, jukebox mode, and 99 preset instrument sounds.	Commodore 64/128	average	Y	Y	Y	Y	Y	Y	N	
Spinnaker Software Corp. One Kendall Square Cambridge, MA 02139 (617) 494-1200	ROCK 'N RHYTHM \$27	Recording program that lets you see tape recorder, drummer, etc., on screen. You can play back recordings while a jukebox flashes brightly. Comes with audio tapes of songs.	Commodore 64/128; 48K Atari	average	Y	Y	Y	Y	Y	N	N	
Tandy/Radio Shack 1800 One Tandy Center Ft. Worth, TX 76102 (817) 338-2395	ORCHESTRA-90 \$80	Software/hardware package for adding stereo music capabilities to computers. You can compose, edit, and play music.	16K TRS-80 Color Computer; 48K TRS-80 Model III	average	Y	N	N	Y	Y	N	N	

Company Name, Address, Phone	Product Name and Cost	Description and Comments	Hardware Required	Learning Level
MUSIC LEARNING SOFTWARE				
Alfred Publishing 15335 Morrison St. Sherman Oaks, CA 91403 (818) 995-8811	MUSIC MADE EASY \$30	A lesson-by-lesson course in music theory. A fun way to supplement instrument lessons.	48K Apple; Commodore 64/128	beginner/intermed.
Baudville 1001 Medical Park Drive S.E. Grand Rapids, MI 49506 (616) 957-3036	GUITAR WIZARD \$40	Helps guitarists learn fingering for all types of chords and scales. You get clear graphic displays of notes and finger positions.	64K Apple	all levels
EduSoft P.O. Box 2560 Berkeley, CA 94702 (800) EDUSOFT	THE MAGIC PIANO LEARNING SYSTEM \$50	Turns your computer keyboard into a piano for composing and computer games. Games include simple rhythm and melody games. Also included is 64-page music workbook.	48K Apple	beginner/intermed.
Electronic Courseware Systems 1210 Lancaster Dr. Champaign, IL 61821 (217) 359-7099	MUSIC ROOM \$40	Ear-training made easy. Six instruments that must be tuned to a tuning pitch are piccolo, violin, trumpet, saxophone, cello, and tuba.	Commodore 64/128	all levels
	EARLY MUSIC SKILLS \$30	Tutorial and drill program designed for the beginning music student. Covers staves, notes, and more. Keeps records of student scores.	48K Apple; Commodore 64/128	beginner
Mastersoft P.O. Box 1027 Bend, OR 97709 (503) 388-7654	MASTERY IN MUSIC SERIES \$50 each unit	Series of instruction programs with titles such as <i>Singing Master</i> , <i>Guitar Master</i> , <i>Flute Master</i> , and more. Each tutorial contains a wealth of information, whether you're a beginner or professional.	Apple II, II+, IIe (Mockingboard required); Commodore 64/128	all levels
Melodian Inc. 115 Broadway, Suite 1202 New York, NY 10006 (212) 327-4566	RHYTHM MASTER \$30	A colorful and progressively more challenging game for improving rhythm and note-pattern recognition. If you fare well, you may end up a master like Bach or Beethoven.	Commodore 64/128	intermed./ advanced
Passport Designs 625 Miramontes St., No. 103 Half Moon Bay, CA 94019 (415) 726-0280	KEYBOARD BLUES \$130	Introduces students to twelve-bar blues and lets students practice playing and hearing the chord changes.	Apple II+, IIe; Commodore 64/128; MIDI-compatible instrument; MIDI interface and cables.	beginner/intermed.
	KEYBOARD NOTE DRILL \$80	A program designed to increase speed in identifying notes randomly placed on staves. The MIDI keyboard is used to select correct answers.	Apple II+, IIe; Commodore 64/128; MIDI-compatible instrument; MIDI interface and cables.	intermediate
Sight & Sound Music Software Inc. 3200 S. 166th St. P.O. Box 27 New Berlin, WI 53151 (800) 558-0910 (800) 328-1223	3001 SOUND ODYSSEY \$25	Powerful synthesizer/sound-shaping program with a good interactive tutorial on sound synthesis and a sequencer for recording.	Commodore 64/128	intermed./ advanced

MUSIC HARDWARE

Company Name, Address, Phone	Product Name and Cost	Product Type and Description	Hardware Required	Ease of Use
ADD-ON KEYBOARDS				
Casio Inc. 15 Garner Road Fairfield, NJ 07006 (201) 575-7400	CZ-101 Cosmo Synthesizer \$499	49-Key/4-octave synthesizer. Mini-size keys. Stores 32 instrument sounds at once (48 with add-on cartridge). MIDI input ¹ and output ² jacks.	To use the CZ-101 with a computer, you need a MIDI interface and cables, along with MIDI software.	difficult
	CZ-230S \$499	100 pre-set sounds; drum sounds are pre-set and programmable; built-in speaker.	To use the CZ-230S with a computer, you need a MIDI interface and cables, along with MIDI software.	difficult
Melodian Inc. 115 Broadway No. 1202 New York, NY 10006 (212) 757-2287	Melodian Keyboard \$99	40-key plastic keyboard. Mini-size keys. Includes interface to hook up to computer, along with <i>Concert Master</i> , <i>Rhythm Master</i> and <i>Score Master</i> software.	Commodore 64/128	easy
Sight & Sound Music Software, Inc. 3200 S. 166th St. New Berlin, WI 53151 (800) 558-0910	Incredible Music Keyboard \$30	24-key plastic keyboard. Half-size keys. Fits over existing computer keyboard. <i>Incredible Music Keyboard</i> software and two music books included.	Commodore 64/128	easy
Yamaha International Corp. P.O. Box 6600 Buena Park, CA 90620 (714) 522-9011	DX-100 Synthesizer \$445	49-key/4-octave synthesizer. Mini-size keys. Holds up to 192 instrument sounds at once. Includes MIDI input, output, and thru ³ jacks.	To use the DX-100 with a computer, you need a MIDI interface and cables, along with MIDI software.	difficult
MIDI INTERFACES				
Dr. T's 66 Louise Road Chestnut Hill, MA 02167 (617) 244-6954	Model-T Interface \$90	MIDI input and output. Plugs into cartridge slot.	Commodore 64/128; SX-64	
Hybrid Arts 11920 W. Olympic Blvd. Los Angeles, CA 90064 (213) 826-4288	MIDIMATE Interface \$200	MIDI input and output.	32K Atari	
Passport Designs 625 Miramontes St., No. 103 Half Moon Bay, CA 94019 (415) 726-0280	Interface with Drum Sync \$149 (Apple) \$129 (Commodore)	Drum sync ⁴ ; MIDI input and output. Plugs into cartridge slot on C-64 and internal slot on Apple IIe.	Commodore 64; Apple IIe	
	Macintosh Interface \$100	MIDI input and output.	Macintosh	
	Passport MPU-401 Compatible Interface \$310	MIDI input and output; drum sync input & output.	IBM PC & compatibles	
Roland Corp. 7200 Dominion Circle Los Angeles, CA 90040 (213) 685-5141	MPU-401 MIDI Processing Unit \$200	1 MIDI input, 2 MIDI outputs.	Apple II+ /IIe; IBM; Commodore 64/128	

¹Input: port for bringing information into instrument or computer. ²output: port for sending information out of instrument or computer. ³thru: jack that allows information to pass through instrument or computer. ⁴drum sync: interfaces with drum machine.

BARRY MANILOW: READY TO TAKE A CHANCE WITH COMPUTERS



"Mandy," "It's a Miracle," "I Write the Songs," "Tryin' to Get the Feeling," "Some Kind of Friend," and "I Made It Through the Rain" are just a few of the 25 Top 40 hits sung by one familiar voice: Barry Manilow's. Since the mid-seventies, Manilow—whose career has spanned songwriting, album recording, the concert stage, Broadway, and television—has been using the ever-popular love theme to relate to audiences of all ages.

Manilow can relate to FAMILY COMPUTING readers in many areas other than love. The 38-year-old Brooklynite spends his free time doing many of the same things that you may do. He enjoys watching "Laverne & Shirley," "60 Minutes," and "Family Feud," and his special interests include word games, crossword puzzles, and best-seller books. He has one other special interest we haven't mentioned yet: computers.

Barry was bitten by the computer bug three years ago, much the same way as he became smitten with the accordion when he was seven years old. Surprisingly, his interest in computers wasn't sparked by a desire to use micros for music: Manilow had begun writing an autobiography and realized that word processing on a computer would be much less cumbersome than typing. This is what Manilow told FAMILY COMPUTING about his first experiences with computers and computer-generated music:

FAMILY COMPUTING: Why did you start looking at computers three years ago?

Manilow: Everyone but me seemed to know about them! So I went out and bought all of the computer magazines I could find. I figured I'd better look into computers. I mean, where had I been? How did all of this computer stuff happen without my

knowing it? I kept reading magazine after magazine until some of the language began to sound familiar. Then I went into my first computer store.

FC: What was your first trip to the computer store like?

Manilow: My first computer salesman was very gentle (he knew I was terrified). But within a half hour, I had spent \$5,000. I didn't believe what I was doing! I bought a Digital Rainbow.

FC: Did you stick with the Rainbow computer?

Manilow: I used the Rainbow 100 for about six months and became absolutely hooked. I mean *hooked*. I wouldn't leave it. I think I liked it even more than I liked the piano!

But I was going on the road and wanted to take my computer with me. I finally discovered the Panasonic Sr. Partner. It's portable, IBM-compatible, and has a built-in printer.

FC: Why do you bring the computer on the road with you?

Manilow: I use the computer daily to communicate with other maniacs on CompuServe and on electronic networks such as the Performing Artists Network (PAN). I've made some interesting friends there. I'm also rolling along with my memoirs.

FC: Barry, you've talked to us about word processing and telecommunications. Don't you use computers to make music?

Manilow: I've been able to connect a few of my keyboards together via MIDI. The MIDI invention is already revolutionizing the music industry. And creating songs with computers is fun.

FC: Let's talk about the novice musician. Do you think computers can be effective music teachers?

Manilow: Computer/keyboard teaching can be a supplement to human teaching. I don't think computers can replace humans in teaching the scales, the études, or the basics of music education. But once you've gotten the basics down, computers can take you further than ever!

—JOEY LATIMER

the Programmer

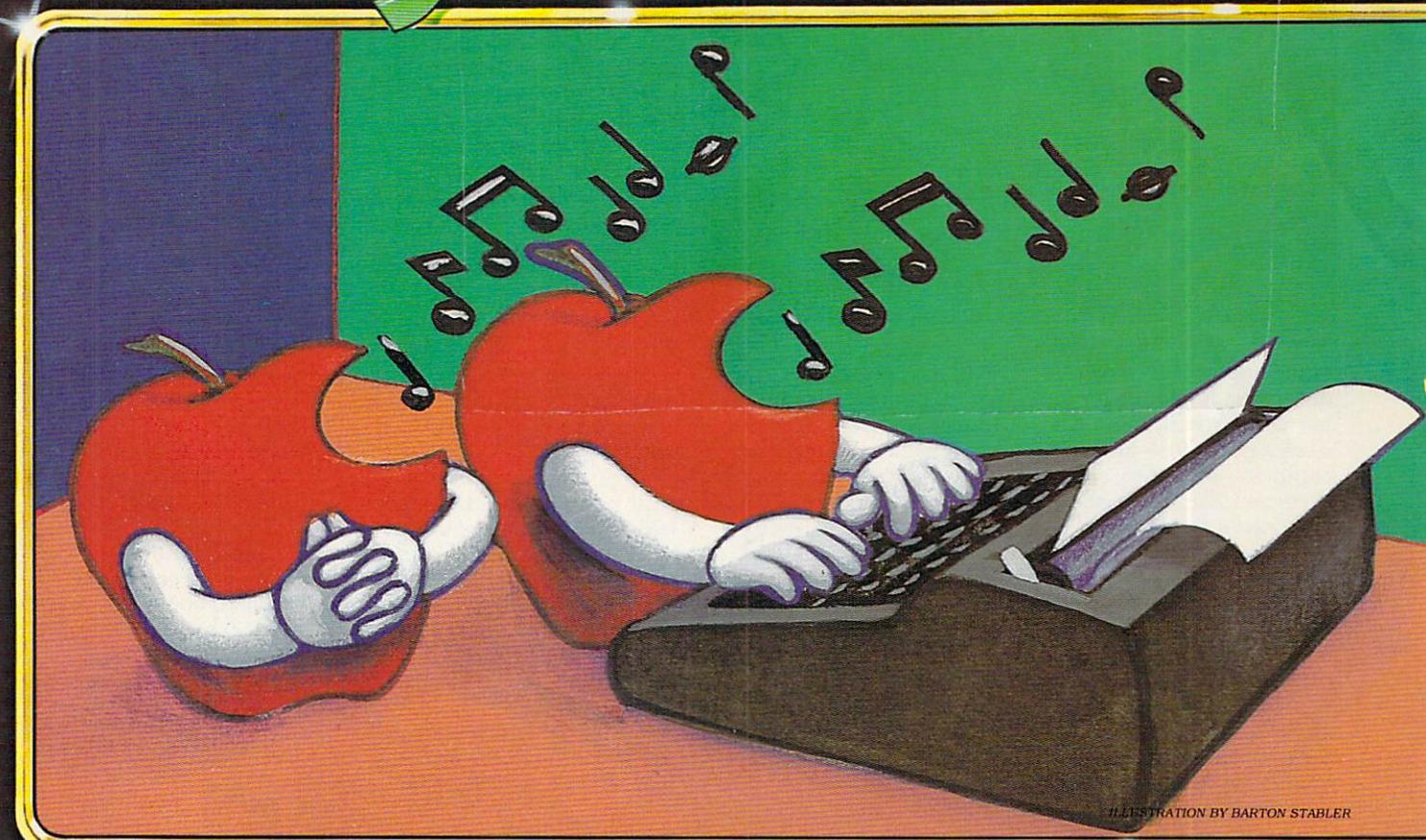


ILLUSTRATION BY BARTON STABLER

AUGUST

HOME HELPER PROGRAM

Page 46

Stop switching back and forth between your word processor and your typewriter! *Electronic Typewriter* will handle those small typing jobs with flair!

FEATURE PROGRAM

Page 62

Calling all Apple owners! Tired of beeps and buzzes? *Apple Harmony* adds two-voice sound to your Apple's repertoire—without special hardware!

PROGRAMMING P.S.

Page 60

TIPS TO THE TYPIST

Page 61

How to type in FAMILY COMPUTING's programs.

MORE PROGRAMS IN K-POWER

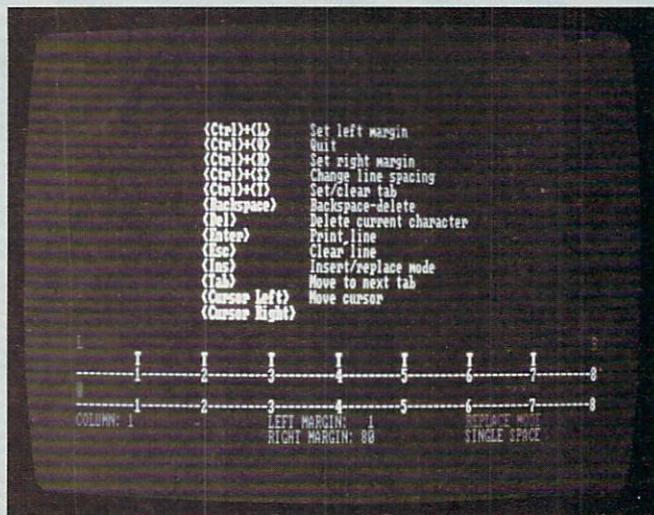
Page 75

Fire off a *Solar Ray Gun* (page 78), or probe the energy grid in *Radar Search* (page 79).

ILLUSTRATION BY JAMES CHERRY III

ELECTRONIC TYPEWRITER

BY STEVEN C.M. CHEN



Electronic Typewriter screen display

Millie spent hundreds of dollars on a printer for her computer system. She uses a powerful—and complex—word processing program. But when she just wants to type up a fast note or address an envelope, it's easier to get out the old typewriter. With our *Electronic Typewriter*, she can make her printer work just like a typewriter. That means she can get a few dollars for the old manual model in the classifieds. Millie's daughter Susan, who's nine years old and finds *Wordstar* bewildering, has no problem understanding *Electronic Typewriter*. What's more, it's fun for her!

Dennis, on the other hand, has no typewriter and a very limited computer budget. He bought a low-cost printer on sale but hasn't yet invested in a word processing program. *Electronic Typewriter* lets him start using his printer for letters and notes.

Electronic Typewriter is not a word processing program. It is an easy-to-use, fun program that makes what you type on your computer's keyboard appear on your printer when you press RETURN or ENTER, just the way an electronic typewriter

works. It even gives you an 80-character "window" (most electronic typewriters have far smaller windows) so you can go back and make changes in a line before it's printed.

USING ELECTRONIC TYPEWRITER

If you want to jump right in, try *Junior Typewriter* (see box). It is a very simple, fun program, but *Electronic Typewriter* gives you most of the features of a standard electronic office typewriter!

Start by making sure your printer is on, online, connected and set properly, and is loaded with paper.

When you RUN the program, you'll see on the screen a list of the key combinations that work on your computer to activate special functions like setting margins and tabs. You'll also see your typing "window," where you can preview what you've typed.

We've tried to make the program work as much like a normal typewriter as possible. To start, you can ignore the special commands and just start typing. You'll see your words appear on the screen before you; and when you press RETURN

or ENTER, the current line will be printed, and your window will clear so you can type the next line.

Then you might want to try setting margins and tabs; check the screen display on your version to find out what key combinations to press in order to activate these functions. One key combination will set or clear a tab stop at the position of the cursor. Another will "backspace-delete," that is, move the cursor and everything to the right of the cursor back one space, erasing what was there before. You can switch between single-, double- and triple-space settings. And your "typewriter's" bell will sound to warn you when you've advanced to within four characters of the right margin.

The program assumes your printer can print at least 80 characters on a line (if it can't, make sure to change the right margin!), but only the IBM and Macintosh versions display all 80 characters on the screen at once. That's why, in the other versions, you'll see your "window" shift as you type, so you're viewing a different part of the 80-character line. Keep your eye on the numbers along the dashed line right above your window; they mark the 10th, 20th, 30th, . . . , and 80th characters.

CATCH THOSE TYPOS!

When you're comfortable using the program as an electric typewriter, give the "electronic" features a try. These let you make corrections. Until you press RETURN or ENTER to print a line, you can fix any error, or, if you like, clear the line and start again. The left and right cursor keys move you back and forth on the line. The typewriter is normally in "insert" mode, so if you type "auditorium" by mistake, you can move

the cursor back to the "r", and when you type "o", it'll be inserted in its proper position.

If you've typed the wrong letter, for example, "garige" instead of "garage," you can move the cursor to the "i", use the "delete" command to get rid of it, and type "a" to insert the correct letter. Or you can switch from "insert" mode to "replace" mode, which lets you type right over your mistakes, replacing them letter for letter.

One note of caution: if you type blank spaces at the end of your line, the program will treat them like regular characters. That is, suppose you have margins of 1 and 80 and have typed the following:

This□is□a□demonstration□of□how□the□program□treats□spaces□as□characters.□□□□

where the □'s represent times you've pressed the space bar. If you then go back and try to insert the word "special" before "demonstration," the program will only let you insert "spe". It thinks your line already had 77 characters. The solution is to go to the end of the line and delete excess spaces.

TYPEWRITER VERSUS WORD PROCESSOR

If you're used to a word processor, you may be surprised at what this program doesn't do. Remember, it works like a typewriter. On a word processor, you can type along pretty much nonstop; on a typewriter—and on our *Electronic Typewriter*—you have to watch out for the ends of lines and make sure you don't begin a word on a line if the whole word won't fit. (You can "release" a margin by moving the cursor past the existing margin, resetting it, and typing the word. But don't forget to return the margins to their original settings!)

Also keep in mind that the program doesn't "remember" what you've typed; once you press RETURN or ENTER, your line is sent to the printer—and is cleared from the computer's memory.

If you're new to writing at your computer, you'll probably eventually find

that you want the advanced features only a word processing program can give you. But even if you have a word processor, you may still find yourself coming back to your faithful old *Electronic Typewriter* for quick notes, envelopes, and labels.

—LP

A FAST START

Along with each version of *Electronic Typewriter*, we're also giving you a super-short program called *Junior Typewriter*. This program has no fancy screen display; it simply sends to your printer every character you type on your keyboard. But it takes only a couple of minutes to type in.

First make sure your printer is properly connected, has its switches set properly, is loaded with paper, and is turned on. Then just go into BASIC, type in and proofread the program, SAVE it, and type RUN.

Depending on the particular printer, computer, and printer card you have, *Junior Typewriter* will work one of two ways. On some systems, the printer will print each letter as you type it; on others, the program will let you type until you've entered a certain number of characters or press RETURN (or ENTER), at which point the entire line will be sent to the printer at once. To stop the program, press the BREAK key. (Use RUN/STOP and RESTORE on the C 128, C 64 and VIC-

20, CONTROL and RESET on the Apple IIe and IIc, RESET on the Apple II Plus, CONTROL and BREAK on the IBM PC and compatibles, and the COMMAND key [the one that looks like a four-leafed clover] and the period key on the Macintosh.)

You have to be a little careful when running this program, because just about anything you type will be sent to your printer. If you press the ESCAPE key, or hold down CONTROL and press a letter key, you're likely to be sending a special control code that might make your printer italicize, skip lines, or do other unexpected things.

On the other hand, because the program gives you direct control of your printer, you can have some fun playing with it. And if you know something about using printer control codes, you'll probably be able to figure out a way to use *Junior Typewriter* to make your printer do just what you want.

If you find your printer does act strangely, turn it off and back on again. If that doesn't help, double-check its switch settings.

```

100 PRINT A$:TAB(16);B$:NEXT L
110 VTAB 19:PRINT "COLUMN: ";CX
120 VTAB 20:PRINT "LEFT MARGIN:":GOSUB 1000
130 VTAB 21:PRINT "RIGHT MARGIN:":GOSUB 2000
140 TS = """:GOSUB 3080:GOSUB 4000:GOSUB 5000
150 VTAB 17:HTAB CX-WL+1
160 GET K$:K = ASC(K$):IF K < 32 OR K = 127 THEN 300
170 T = LEN(T$):IF T = 0 AND K$ = SP$ THEN 280
180 IF CX < LM OR CX > RM THEN 610
190 IF CX <= T THEN 250
200 V = CX-T-1:IF V = 0 THEN TS = TS+K$:GOTO 220
210 TS = TS+LEFT$(L$,V)+K$
220 IF CX = WR THEN 290
230 PRINT KS:IF CX = RM-4 THEN PRINT GS;
240 CX = CX+1:VTAB 19:HTAB 9:PRINT CX:GOTO 150
250 IF LEN(T$) >= RM AND NOT MD THEN 610
260 IF CX = 1 THEN TS = KS+MID$(T$,CX+MD):GOTO 280
270 TS = LEFT$(T$,CX-1)+KS+MID$(T$,CX+MD)
280 IF LEN(T$) = RM-4 AND NOT MD THEN PRINT GS;
290 CX = CX+1:CX = CX-(CX = 81):GOTO 440
300 KS = 0:FOR L = 1 TO 14
310 IF M(L) = K THEN KS = L:L = 14
320 NEXT L:IF KS = 0 THEN 610
330 ON KS GOTO 340,340,360,360,400,450,490,530,580,590
,600,650,670,700
340 CX = CX+(K = 21)-(K = 8)
350 CX = CX+(CX = 0)-(CX = 81):GOSUB 3000:GOTO 150
360 IF CX <= LM OR CX = 1 THEN 610
370 IF TS = """:THEN CX = CX-1:GOSUB 3000:GOTO 150
380 IF CX = 2 THEN TS = MID$(T$,2):GOTO 430
390 TS = LEFT$(T$,CX-2)+MID$(T$,CX):GOTO 430
400 IF CX < LM OR CX > LEN(T$) THEN 610
410 IF CX = 1 THEN TS = MID$(T$,2):GOTO 440
420 TS = LEFT$(T$,CX-1)+MID$(T$,CX+1):GOTO 440
430 CX = CX-1
440 GOSUB 3000:GOSUB 6000:GOTO 150
450 T = CX:FOR L = CX+1 TO 80
460 IF TB(L) = 1 THEN CX = L:L = 80
470 NEXT L:IF T = CX THEN 610
480 GOSUB 3000:GOTO 150
490 IF CX >= RM THEN 610
500 IF LM < WL OR LM > WR THEN 520
510 VTAB 14:HTAB LM-WL+1:PRINT SP$
520 LM = CX:GOSUB 1000:GOTO 150
530 VTAB 22:PRINT:PRINT CHR$(4);"PR#1":PRINT TS
540 IF ST = 1 THEN 560
550 IF ST > 1 THEN FOR L = 1 TO ST-1:PRINT:NEXT L
560 VTAB 22:HTAB 1:PRINT CHR$(4);"PR#0"
570 HTAB 22:HTAB 1:PRINT L$::GOTO 700
580 MD = NOT MD:GOSUB 4000:GOTO 150
590 VTAB 22:HTAB 1:END
600 IF CX > LM THEN 620
610 PRINT GS;GS:GOTO 150
620 IF RM < WL OR RM > WR THEN 640
630 VTAB 14:HTAB RM-WL+1:PRINT SP$
640 RM = CX:GOSUB 2000:GOTO 150
650 ST = ST+1:IF ST = 4 THEN ST = 1
660 GOSUB 5000:GOTO 150
670 TB(CX) = NOT TB(CX):VTAB 15:HTAB CX-WL+1
680 IF TB(CX) = 0 THEN PRINT SP$:GOTO 150
690 PRINT "T":GOTO 150
700 Z$ = """:T$ = """":VTAB 17:HTAB 1:PRINT CL$ 
710 CX = LM:GOSUB 3000:GOTO 150
1000 VTAB 20:HTAB 14+(LM < 10):PRINT SP$;LM;SP$ 
1010 IF LM < WL OR LM > WR THEN RETURN
1020 INVERSE:VTAB 14:HTAB LM-WL+1:PRINT "L"
1030 NORMAL:RETURN
2000 VTAB 21:HTAB 14+(RM < 10):PRINT SP$;RM;SP$ 
2010 IF RM < WL OR RM > WR THEN RETURN
2020 INVERSE:VTAB 14:HTAB RM-WL+1:PRINT "R"
2030 NORMAL:RETURN
3000 VTAB 19:HTAB 9:PRINT CX;SP$ 
3010 IF CX >= WL AND CX <= WR THEN RETURN
3020 VTAB 14:HTAB 1:PRINT CL$:IF CX < WL THEN 3050
3030 WR = CX+10:IF WR > 80 THEN WR = 80
3040 WL = WR-39:GOTO 3070

```

Apple II series w/printer/*Junior Typewriter*

```

10 PRINT:PRINT CHR$(4);"PR#1"
20 GET A$:PRINT A$:GOTO 20

```

Apple II series w/printer/*Electronic Typewriter*

```

10 DIM TB(81),M(14)
20 LM = 1:RM = 80:ST = 1:MD = 0:CX = 1:WL = 1:WR = 40
30 FOR L = 1 TO 81:TB(L) = 0:NEXT L
40 FOR L = 10 TO 70 STEP 10:TB(L) = 1:NEXT L
50 SP$ = CHR$(32):FOR L = 1 TO 40:CL$ = CL$+SP$:NEXT L
60 LS$ = CL$+CL$:GS$ = CHR$(7):GD$ = """":FOR L = 1 TO 8
70 GD$ = GD$+"-----"+CHR$(48+L):NEXT L
80 FOR L = 1 TO 14:READ M(L):NEXT L
90 HOME:FOR L = 1 TO 13:READ A$,BS

```

HOME HELPER PROGRAM

```

3050 WL = CX-10:IF WL < 1 THEN WL = 1
3060 WR = WL+39
3070 VTAB 15:HTAB 1:PRINT CL$
3080 FOR L = WL TO WR:IF TB(L) = 0 THEN 3100
3090 VTAB 15:HTAB L-WL+1:PRINT "T"
3100 NEXT L:GOSUB 6000
3110 VTAB 16:HTAB 1:PRINT MID$(GD$,WL,40)
3120 VTAB 18:HTAB 1:PRINT MID$(GD$,WL,40)
3130 GOSUB 1010:GOSUB 2010:RETURN
4000 VTAB 19:HTAB 21:IF MD THEN INVERSE:PRINT "REPLACE
    MODE":NORMAL:RETURN
4010 PRINT "INSERT MODE";SP$:RETURN
5000 VTAB 20:HTAB 21:ON ST GOTO 5010,5020,5030
5010 PRINT "SINGLE SPACE":RETURN
5020 INVERSE:PRINT "DOUBLE SPACE":NORMAL:RETURN
5030 INVERSE:PRINT "TRIPLE SPACE":NORMAL:RETURN
6000 T = LEN(T$):IF T < WL THEN Z$ = "":GOTO 6030
6010 IF T < WR THEN Z$ = MID$(T$,WL,T-WL+1):GOTO 6030
6020 Z$ = MID$(T$,WL,40)
6030 VTAB 17:HTAB 1:T = LEN(Z$)
6040 IF T = 40 THEN PRINT Z$:RETURN
6050 PRINT Z$;LEFT$(CL$,40-T):RETURN
7000 DATA 8,21,2,127,4,9,12,13,16,17,18,19,20,27
8000 DATA <CTRL>+<B>;OR,"",<DELETE>;BACKSPACE-DELETE
8010 DATA <CTRL>+<D>;DELETE CURRENT CHARACTER
8020 DATA <CTRL>+<L>;SET LEFT MARGIN
8030 DATA <CTRL>+<P>;INSERT/REPLACE MODE
8040 DATA <CTRL>+<Q>;QUIT
8050 DATA <CTRL>+<R>;SET RIGHT MARGIN
8060 DATA <CTRL>+<S>;CHANGE LINE SPACING
8070 DATA <CTRL>+<T>;SET/CLEAR TAB
8080 DATA <ESC>;CLEAR LINE,<RETURN>;PRINT LINE
8090 DATA <TAB>;MOVE TO NEXT TAB
8100 DATA <- OR ->;MOVE CURSOR

```

Atari 400/800, 600/800XL, or 130XE w/printer/Junior Typewriter

```

10 OPEN #1,4,0,"K":OPEN #2,8,0,"P:"
20 GET #1,KEY:PRINT CHR$(KEY);:PUT #2,KEY
30 GOTO 20

```

Atari 400/800, 600/800XL, or 130XE w/printer/Electronic Typewriter

```

10 LM=1:RM=80:ST=1:MD=1:CX=1:WL=1:WR=39:HI=0
20 DIM M(13),A$(20),B$(20),CLS$(39),GD$(80),KS$(1)
30 DIM SP$(1),T$(80),TAB$(80),X$(80)
40 GD$=CHR$(45):GD$(80)=GD$:GD$(2)=GD$
50 SP$=CHR$(32):CL$=SP$:CLS$(39)=SP$:CLS$(2)=CLS
60 TAB$=SP$:TAB$(80)=SP$:TAB$(2)=TAB$:T$=TAB$
70 FOR L=1 TO 7:TAB$(L*10,L*10)=CHR$(212):NEXT L
80 FOR L=1 TO 8:GD$(L*10,L*10)=CHR$(L+48):NEXT L
90 FOR L=1 TO 13:READ M:M(L)=M:NEXT L
100 GRAPHICS 0:POKE 752,1:POKE 16,64:POKE 53774,64
110 OPEN #1,4,0,"K":FOR L=0 TO 12:READ A$,B$
120 PRINT A$;:POKE 85,19:PRINT B$:NEXT L
130 POSITION 0,19:PRINT "Column: ";CX
140 POSITION 0,20:PRINT "Left margin: ";:GOSUB 1000
150 POSITION 0,21:PRINT "Right margin: ":GOSUB 2010
160 GOSUB 3070:GOSUB 4000:GOSUB 5000
170 POSITION CX-WL,16
180 POKE 752,0:PRINT CHR$(29);:POKE 752,1
190 POKE 694,0:GET #1,K:KS=CHR$(K)
200 IF K<32 OR K>124 THEN 280
210 IF (HI=RM AND MD) OR (CX<LM OR CX>RM) THEN 580
220 IF NOT MD THEN T$(CX,CX)=K$:GOTO 240
230 X$=T$(CX):T$(CX+(CX>80))=X$:T$(CX,CX)=K$:HI=HI+1
240 CX=CX+(CX>80):IF CX>WR OR CX<WL THEN GOSUB 3000
250 IF CX=RM-4 THEN PRINT CHR$(253);
260 IF CX>HI THEN HI=CX-1
270 GOSUB 6000:GOTO 170
280 KS=0:FOR L=1 TO 13:IF M(L)=K THEN KS=L:L=13

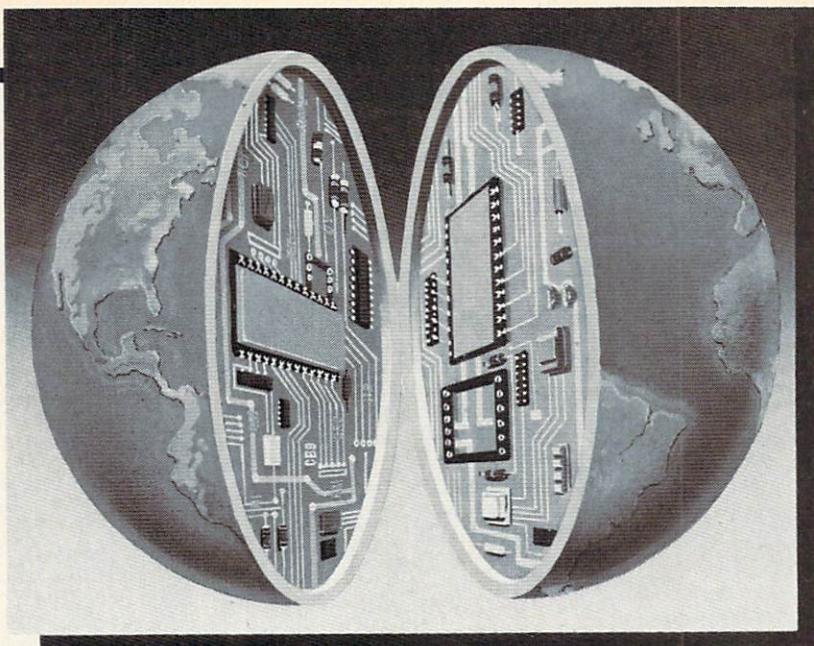
```

```

290 NEXT L:IF KS=0 THEN 580
300 ON KS GOTO 310,310,420,330,510,380,540,650,470,570
    ,630,550,680
310 CX=CX+(K=31)-(K=30)
320 CX=CX+(CX=0)-(CX=81):GOSUB 3000:GOTO 170
330 IF CX=L:LM THEN 580
340 CX=CX-1:IF CX<=RM THEN HI=HI-1
350 IF CX<WL THEN GOSUB 3000
360 X$=T$(CX+1):T$(CX)=X$:T$(80)=SP$
370 GOSUB 6000:GOTO 170
380 IF (CX<LM) OR (CX>HI) THEN 580
390 X$=T$(CX+1):T$(CX)=X$:T$(80)=SP$
400 IF CX<=HI THEN HI=HI-1
410 GOSUB 6000:GOTO 170
420 IF CX=80 THEN 580
430 T=CX:FOR L=CX+1 TO 80
440 IF TAB$(L,L)=CHR$(212) THEN CX=L:L=80
450 NEXT L:IF T=CX THEN 580
460 GOSUB 3000:GOTO 170
470 IF CX>=RM THEN 580
480 IF LM<WL OR LM>WR THEN 500
490 POSITION LM-WL,14:PRINT SP$
500 LM=CX:GOSUB 1000:GOTO 170
510 LPRINT T$:IF ST=1 THEN 680
520 FOR L=2 TO ST:LPRINT :NEXT L
530 GOTO 680
540 MD=1-MD:GOSUB 4000:GOTO 170
550 POKE 16,192:POKE 53774,192
560 POSITION 2,21:POKE 752,0:END
570 IF CX>LM THEN 600
580 FOR L=15 TO 0 STEP -1:SOUND 0,100,10,L:NEXT L
590 GOTO 190
600 IF RM<WL OR RM>WR THEN 620
610 POSITION RM-WL,14:PRINT SP$
620 RM=CX:GOSUB 2010:GOTO 170
630 ST=ST+1:IF ST=4 THEN ST=1
640 GOSUB 5000:GOTO 170
650 IF TAB$(CX,CX)=SP$ THEN TAB$(CX,CX)=CHR$(212):GOTO
    670
660 TAB$(CX,CX)=SP$
670 POSITION 0,15:PRINT TAB$(WL,WR):GOTO 170
680 T$=SP$:T$(80)=SP$:T$(2)=T$:CX=LM:HI=LM-1
690 GOSUB 3000:GOSUB 6000:GOTO 170
1000 POSITION 13+(LM<10),20:PRINT SP$,LM,SP$
1010 IF LM<WL OR LM>WR THEN RETURN
1020 POSITION LM-WL,14:PRINT CHR$(204)
2000 RETURN
2010 POSITION 13+(RM<10),21:PRINT SP$,RM,SP$
2020 IF RM<WL OR RM>WR THEN RETURN
2030 POSITION RM-WL,14:PRINT CHR$(210)
2040 RETURN
3000 POSITION 8,19:PRINT CX,SP$
3010 IF CX>WL AND CX<=WR THEN RETURN
3020 POSITION 0,14:PRINT CL$:IF CX<WL THEN 3050
3030 WR=CX+10:IF WR>80 THEN WR=80
3040 WL=WR-38:GOTO 3070
3050 WL=CX-10:IF WL<1 THEN WL=1
3060 WR=WL+38
3070 POSITION 0,15:PRINT TAB$(WL,WR)
3080 GOSUB 6000
3090 POSITION 0,16:PRINT GD$(WL,WR)
3100 POSITION 0,18:PRINT GD$(WL,WR)
3110 GOSUB 1010:GOSUB 2020:RETURN
4000 POSITION 21,19
4010 IF MD THEN PRINT "Insert mode";SP$:RETURN
4020 PRINT "Replace mode":RETURN
5000 POSITION 21,20:ON ST GOTO 5010,5020,5030
5010 PRINT "Single space":RETURN
5020 PRINT "Double space":RETURN
5030 PRINT "Triple space":RETURN
6000 POSITION 0,17:PRINT T$(WL,WR)
6010 POSITION 8,19:PRINT CX,SP$:RETURN
7000 DATA 30,31,127,126,155,254,157,20,12,18,19,17,156
8000 DATA <CTRL>+<L>;Set left margin
8010 DATA <CTRL>+<R>;Set right margin

```





CIE MAKES THE WORLD OF ELECTRONICS YOURS.

Today's world is the world of electronics. But to be a part of it, you need the right kind of training, the kind you get from CIE, the kind that can take you to a fast growing career in business, medicine, science, government, aerospace, communications, and more.

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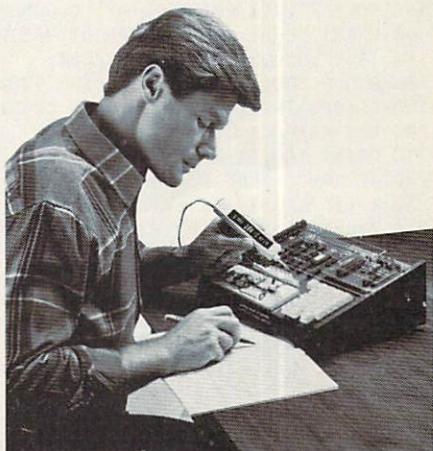
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HOME HELPER PROGRAM

```

8020 DATA <CTRL>+<Q>,Quit
8030 DATA <CTRL>+<S>,Change Line spacing
8040 DATA <CTRL>+<T>,Set/clear tab
8050 DATA <SHIFT>+<DELETE>,Clear Line
8060 DATA <CTRL>+<DELETE>,Delete current char.
8070 DATA <SHIFT>+<INSERT>,Insert/replace mode
8080 DATA <BACKSPACE>,Backspace-delete
8090 DATA <RETURN>,Print line
8100 DATA <TAB>,Move to next tab
8110 DATA <-->,Move cursor left
8120 DATA -->,Move cursor right

```

Commodore 64 or 128 (C 64 mode) w/printer/Junior Typewriter

```

10 OPEN 4,4
20 GET K$:IF K$="" THEN 20
30 PRINT K$;:PRINT#4,K$;:GOTO 20

```

Commodore 64 or 128 (C 64 mode) w/printer/Electronic Typewriter

```

10 DIM TB(81),M(13):POKE 650,128:OPEN 4,4
20 S=54272:FOR X=0 TO 24:POKE S+X,0:NEXT X
30 POKE S+5,9:POKE S+6,0:POKE S+1,100:POKE S+24,15
40 LM=1:RM=80:SM=0:CX=1:WL=1:WR=39
50 FOR L=1 TO 81:TB(L)=0:NEXT L
60 FOR L=10 TO 70 STEP 10:TB(L)=1:NEXT L
70 CY$=CHR$(159):WH$=CHR$(5):YES$=CHR$(158)
80 SP$=CHR$(32):BK$=CHR$(18)+SP$+CHR$(146)+CHR$(157)
90 CL$=SP$:FOR L=1 TO 38:CL$=CL$+SP$:NEXT L
100 LS$=CL$+CL$+SP$:GD$="":FOR L=1 TO 8
110 GD$=GD$+"-----"+CHR$(48+L):NEXT L
120 FOR L=1 TO 13:READ M(L):NEXT L
130 PRINT CHR$(147);:FOR L=1 TO 12:READ A$,B$
140 PRINT WH$;A$;TAB(12);CY$;B$:NEXT L
150 POKE 214,18:PRINT:PRINT "COLUMN:";CX
160 PRINT "LEFT MARGIN:";PRINT "RIGHT MARGIN:"
170 T$="":GOSUB 1080:GOSUB 2000
180 GOSUB 3000:GOSUB 5000:GOSUB 6000
190 C$=SP$:IF CX<=LEN(T$) THEN C$=MID$(T$,CX,1)
200 GET K$:POKE 214,16:PRINT
210 PRINT TAB(CX-WL);BK$;C$;CHR$(157);
220 IF K$="" THEN 200
230 K=ASC(K$):IF K<32 OR K>127 THEN 350
240 T=LEN(T$):IF T=0 AND K$=SP$ THEN 330
250 IF CX<LM OR CX>RM THEN 590
260 IF CX<=T THEN 300
270 T$=T$+LEFT$(L$,CX-T-1)+K$:IF CX=WR THEN 340
280 PRINT K$;:IF CX=RM-4 THEN DL=1:GOSUB 7000
290 CX=CX+1:POKE 214,18:PRINT:PRINT TAB(7);CX:GOTO 190
300 IF MD THEN T$=LEFT$(T$,CX-1)+K$+MID$(T$,CX+1):GOTO 340
310 IF LEN(T$)>=RM THEN 590
320 T$=LEFT$(T$,CX-1)+K$+MID$(T$,CX)
330 IF LEN(T$)=RM-4 THEN DL=1:GOSUB 7000
340 CX=CX+1:CX=CX+(CX=81):GOTO 450
350 KS=0:FOR L=1 TO 13:IF M(L)=K THEN KS=L:L=14
360 NEXT L:IF KS=0 THEN 590
370 ON KS GOTO 380,380,400,430,460,490,530,560,570,580
,630,650,680
380 CX=CX+(K=157)-(K=29)
390 CX=CX-(CX=0)+(CX=81):GOSUB 1000:GOTO 190
400 IF CX<=LM OR CX>=1 THEN 590
410 IF T$="" THEN CX=CX-1:GOSUB 1000:GOTO 190
420 T$=LEFT$(T$,CX-2)+MID$(T$,CX):CX=CX-1:GOTO 450
430 IF CX<LM OR CX>LEN(T$) THEN 590
440 T$=LEFT$(T$,CX-1)+MID$(T$,CX+1)
450 GOSUB 1000:GOSUB 4000:GOTO 190
460 T=CX:FOR L=CX+1 TO 80:IF TB(L)=1 THEN CX=L:L=80
470 NEXT L:IF T=CX THEN 590
480 GOSUB 1000:GOTO 190
490 IF CX>=RM THEN 590
500 IF LM<WL OR LM>WR THEN 520
510 POKE 214,13:PRINT:PRINT TAB(LM-WL);SP$
520 LM=CX:GOSUB 5000:GOTO 190
530 PRINT#4,T$

```

```

540 IF SM>1 THEN FOR L=1 TO SM-1:PRINT#4:NEXT L
550 GOTO 680
560 MD=NOT MD:GOSUB 2000:GOTO 190
570 POKE S+24,0:PRINT#4:CLOSE 4:POKE 214,22:PRINT:END
580 IF CX>LM THEN 600
590 DL=3:GOSUB 7000:GOTO 190
600 IF RM<WL OR RM>WR THEN 620
610 POKE 214,13:PRINT:PRINT TAB(RM-WL);SP$
620 RM=CX:GOSUB 6000:GOTO 190
630 SM=SM+1:IF SM=4 THEN SM=1
640 GOSUB 3000:GOTO 190
650 TB(CX)=ABS(NOT -TB(CX)):POKE 214,14:PRINT
660 IF TB(CX)=0 THEN PRINT TAB(CX-WL);SP$:GOTO 190
670 PRINT TAB(CX-WL);YES$;"T";CY$:GOTO 190
680 Z$="":TS="":POKE 214,16:PRINT:PRINT CL$
690 CX=LM:GOSUB 1000:GOTO 190
1000 POKE 214,18:PRINT:PRINT TAB(7);STR$(CX);SP$
1010 IF CX>=WL AND CX<=WR THEN RETURN
1020 POKE 214,13:PRINT:PRINT CL$:IF CX<WL THEN 1050
1030 WR=CX+10:IF WR>80 THEN WR=80
1040 WL=WR-38:GOTO 1070
1050 WL=CX-10:IF WL<1 THEN WL=1
1060 WR=WL+38
1070 POKE 214,14:PRINT:PRINT CL$
1080 FOR L=WL TO WR:IF TB(L)=0 THEN 1100
1090 POKE 214,14:PRINT:PRINT TAB(L-WL);YES$;"T";CY$;
1100 NEXT L:GOSUB 4000
1110 POKE 214,15:PRINT:PRINT MID$(GD$,WL,39)
1120 POKE 214,17:PRINT:PRINT MID$(GD$,WL,39)
1130 GOSUB 5020:GOSUB 6020:RETURN
2000 POKE 214,18:PRINT
2010 IF MD THEN PRINT TAB(20);WH$;"REPLACE MODE";CY$:R
ETURN
2020 PRINT TAB(20);"INSERT MODE";SP$:RETURN
3000 POKE 214,19:PRINT:ON SM GOTO 3010,3020,3030
3010 PRINT TAB(20);"SINGLE SPACE":RETURN
3020 PRINT TAB(20);WH$;"DOUBLE SPACE";CY$:RETURN
3030 PRINT TAB(20);WH$;"TRIPLE SPACE";CY$:RETURN
4000 T=LEN(T$):IF T<WL THEN Z$="":GOTO 4030
4010 IF T<WR THEN Z$=MID$(T$,WL,T-WL+1):GOTO 4030
4020 Z$=MID$(T$,WL,39)
4030 POKE 214,16:PRINT
4040 PRINT Z$;LEFT$(CL$,39-LEN(Z$));:RETURN
5000 POKE 214,19:PRINT
5010 PRINT TAB(13-(LM<10));STR$(LM);SP$
5020 IF LM<WL OR LM>WR THEN RETURN
5030 POKE 214,13:PRINT
5040 PRINT TAB(LM-WL);YES$;"L";CY$:RETURN
6000 POKE 214,20:PRINT
6010 PRINT TAB(13-(RM<10));STR$(RM);SP$
6020 IF RM<WL OR RM>WR THEN RETURN
6030 POKE 214,13:PRINT
6040 PRINT TAB(RM-WL);YES$;"R";CY$:RETURN
7000 POKE S+4,17:FOR D=1 TO DL*60:NEXT D
7010 POKE S+4,16:RETURN
8000 DATA 157,29,20,172,162,182,13
8010 DATA 148,171,178,174,163,19
9000 DATA <C>+<D>,DELETE CURRENT CHARACTER
9010 DATA <C>+<I>,MOVE TO NEXT TAB
9020 DATA <C>+<L>,SET LEFT MARGIN
9030 DATA <C>+<Q>,QUIT,<C>+<R>,SET RIGHT MARGIN
9040 DATA <C>+<S>,CHANGE LINE SPACING
9050 DATA <C>+<T>,SET/CLEAR TAB
9060 DATA <DEL>,BACKSPACE-DELETE
9070 DATA <RETURN>,PRINT LINE,<HOME>,CLEAR LINE
9080 DATA <INST>,INSERT/REPLACE MODE
9090 DATA <- OR ->,MOVE CURSOR

```

IBM PC or compatible w/printer/Junior Typewriter

This program has been tested and found to work on the following computers and hardware configurations, using the BASICs shown: IBM PC w/Color/Graphics Monitor Adapter or Monochrome/Printer card, w/Disk BASIC D.2.00 or Advanced BASIC A2.00, IBM PCjr w/cartridge BASIC J1.00, Tandy 1000 w/GWBASIC 2.02 version 01.01.00. It should also work on many other PC compatibles.

```

10 K$=INKEY$:IF K$="" THEN 10
20 PRINT K$;LPRINT K$;:GOTO 10

```

IBM PC or compatible w/printer/Electronic Typewriter

This program has been tested and found to work on the following computers and hardware configurations, using the BASICs shown: IBM PC w/Color/Graphics Monitor Adapter or Monochrome/Printer card, w/Disk BASIC D2.00 or Advanced BASIC A2.00. IBM PCjr w/128K RAM, w/80-column monitor, w/Cartridge BASIC J1.00. Tandy 1000 w/GW BASIC 2.02 version 0.01.00. It should also work on many other PC compatibles.

```

10 DIM TB(80):KEY OFF:SCREEN 0,0:WIDTH 80
20 LM=1:RM=80:ST=1:MD=0:CX=1:WIDTH "LPT1:",81
30 FOR L=1 TO 80:TB(L)=0:NEXT L
40 SPS=CHR$(32):CLS=STRING$(80,32)
50 GD$="":FOR L=1 TO 8
60 GD$=GD$+STRING$(9,45)+CHR$(48+L):NEXT L
70 MS="":FOR L=1 TO 9:READ T:MS=MS+CHR$(T):NEXT L
80 NS="":FOR L=1 TO 4:READ T:NS=NS+CHR$(T):NEXT L
90 CLS:FOR L=1 TO 13:READ A$,B$
100 COLOR 15:PRINT TAB(20);A$
110 COLOR 10:LOCATE L,36:PRINT B$:NEXT L
120 COLOR 11:FOR L=10 TO 70 STEP 10:TB(L)=1
130 LOCATE 16,L:PRINT "T":NEXT L
140 COLOR 2,0:LOCATE 20,1:PRINT "COLUMN":;CX
150 LOCATE 20,30:PRINT "LEFT MARGIN":;GOSUB 1000
160 LOCATE 21,30:PRINT "RIGHT MARGIN":;GOSUB 2000
170 COLOR 7:LOCATE 17,1:PRINT GD$
180 LOCATE 19,1:PRINT GD$
190 COLOR 2,0:GOSUB 3000:GOSUB 4000:T$=""
200 LOCATE 18,CX,1,0,7
210 K$=INKEY$:IF K$="" THEN 210
220 LOCATE ,0,6,7:IF K$>CHR$(31) THEN 310
230 IF LEN(K$)<>2 THEN 430
240 K$=RIGHT$(K$,1):KS=INSTR(NS,K$):IF KS=0 THEN 600
250 ON KS GOTO 260,260,280,290
260 K=ASC(K$):CX=CX+(K=75)-(K=77)
270 CX=CX-(CX=0)+(CX=81):GOSUB 5000:GOTO 200
280 MD=NOT MD:GOSUB 3000:GOTO 200
290 IF CX<LM OR CX>LEN(T$) THEN 600

```

```

300 T$=LEFT$(T$,CX-1)+MID$(T$,CX+1):GOTO 480
310 T=LEN(T$):IF T=0 AND K$=SPS THEN 410
320 IF CX<LM OR CX>RM THEN 600
330 IF CX<=T THEN 380
340 T$=T$+SPACE$(CX-T-1)+K$:PRINT K$;
350 IF CX=RM-4 THEN SOUND 1000,2
360 CX=CX+1:CX=CX+(CX=81)
370 LOCATE 20,8:PRINT CX:GOTO 200
380 IF MD THEN T$=LEFT$(T$,CX-1)+K$+MID$(T$,CX+1):PRINT K$;;GOTO 360
390 IF LEN(T$)>=RM THEN 600
400 T$=LEFT$(T$,CX-1)+K$+MID$(T$,CX)
410 IF LEN(T$)=RM-4 THEN SOUND 1000,2
420 CX=CX+1:CX=CX+(CX=81):GOTO 480
430 KS=INSTR(MS,K$):IF KS=0 THEN 600
440 ON GS GOTO 450,500,520,550,580,590,630,650,680
450 IF CX<LM OR CX=1 THEN 600
460 IF T$="" THEN CX=CX-1:GOSUB 5000:GOTO 200
470 T$=LEFT$(T$,CX-2)+MID$(T$,CX):CX=CX-1
480 GOSUB 5000:LOCATE 18,1
490 PRINT T$:LEFT$(CL$,80-LEN(T$)):GOTO 200
500 T=CX:FOR L=CX+1 TO 80:IF TB(L)=1 THEN CX=L:L=80
510 NEXT L:IF T=CX THEN 600 ELSE GOSUB 5000:GOTO 200
520 IF CX>RM THEN 600
530 LOCATE 15,LM:PRINT SPS
540 LM=CX:GOSUB 1000:GOTO 200
550 LPRINT T$
560 IF ST>1 THEN FOR L=1 TO ST-1:LPRINT:NEXT L
570 GOTO 680
580 LOCATE 23,1:END
590 IF CX>LM THEN 610
600 SOUND 1000,4:GOTO 200
610 LOCATE 15,RM:PRINT SPS
620 RM=CX:GOSUB 2000:GOTO 200
630 ST=ST+1:IF ST=4 THEN ST=1
640 GOSUB 4000:GOTO 200

```



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HOME HELPER PROGRAM

```

650 TB(CX)=ABS(NOT -TB(CX)):COLOR 11:LOCATE 16,CX
660 IF TB(CX)=0 THEN PRINT SP$ ELSE PRINT "T"
670 COLOR 2:GOTO 200
680 TS=""":LOCATE 18,1:PRINT CL$
690 CX=LM:GOSUB 5000:GOTO 200
1000 LOCATE 20,43-(LM<10):PRINT LM;SP$
1010 COLOR 12:LOCATE 15,LM:PRINT "L":COLOR 2:RETURN
2000 LOCATE 21,43-(RM<10):PRINT RM;SP$
2010 COLOR 12:LOCATE 15,RM:PRINT "R":COLOR 2:RETURN
3000 LOCATE 20,60:IF MD THEN COLOR 12:PRINT "REPLACE M
ODE":COLOR 2:RETURN
3010 PRINT "INSERT MODE";SP$:RETURN
4000 LOCATE 21,60:ON ST GOTO 4010,4020,4030
4010 PRINT "SINGLE SPACE":RETURN
4020 COLOR 12:PRINT "DOUBLE SPACE":COLOR 2:RETURN
4030 COLOR 12:PRINT "TRIPLE SPACE":COLOR 2:RETURN
5000 LOCATE 20,8:PRINT CX;SP$:RETURN
6000 DATA 8,9,12,13,17,18,26,20,27,75,77,82,83
7000 DATA <Ctrl>+<L>,Set left margin
7010 DATA <Ctrl>+<Q>,Quit,<Ctrl>+<R>,Set right margin
7020 DATA <Ctrl>+<T>,Set/clear tab
7030 DATA <Ctrl>+<Z>,Change line spacing
7040 DATA <Backspace>,Backspace-delete
7050 DATA <Del>,Delete current character
7060 DATA <Enter>,Print Line,<Esc>,Clear Line
7070 DATA <Ins>,Insert/replace mode
7080 DATA <Tab>,Move to next tab,<Cursor Left>
7090 DATA Move cursor,<Cursor Right>,""

```

Macintosh w/Microsoft BASIC 2.0 or 2.1 & printer/Junior Typewriter

```

10 K$=INKEY$:IF K$="" THEN 10
20 IF K$=CHR$(13) THEN K$=K$+CHR$(10)
30 PRINT K$;:PLPRINT K$;:GOTO 10

```

Macintosh w/Microsoft BASIC 2.0 or 2.1 & printer/Electronic Typewriter

```

10 DIM TB(80):CALL TEXTFONT(4):CALL TEXTSIZE(9)
20 CALL TEXTMODE(0):WIDTH 85
30 WINDOW 1,,(0,38)-(527,338)
40 LM=1:RM=80:ST=1:MD=0:CX=1
50 FOR L=1 TO 80:TB(L)=0:NEXT L
60 SP$=CHR$(32):CLS$=STRING$(80,32)
70 GD$="":FOR L=1 TO 8
80 GD$=GD$+STRING$(9,45)+CHR$(48+L):NEXT L
90 MS="":FOR L=1 TO 20:READ T:MS=MS+CHR$(T):NEXT L
100 CLS:FOR L=1 TO 13:READ A$,BS
110 CALL TEXTFACE(1):PRINT TAB(20);A$;
120 CALL TEXTFACE(0):PRINT TAB(40);BS:NEXT L
130 FOR L=10 TO 70 STEP 10
140 LOCATE 16,L:PRINT "T";:TB(L)=1:NEXT L
150 LOCATE 17,1:PRINT GD$:LOCATE 19,1:PRINT GD$
160 LOCATE 20,1:PRINT "COLUMN";:CX
170 LOCATE 20,30:PRINT "LEFT MARGIN"::GOSUB 1000
180 LOCATE 21,30:PRINT "RIGHT MARGIN"::GOSUB 2000
190 TS="":GOSUB 3000:GOSUB 4000
200 CALL TEXTMODE(2)
210 IF CX>LEN(T$) THEN C$=SP$ ELSE C$=MID$(T$,CX,1)
220 K$=INKEY$:LOCATE 18,CX:PRINT "_">CHR$(8);C$;
230 IF K$="" THEN 220 ELSE CALL TEXTMODE(0)
240 K=ASC(K$):IF K<32 OR K>127 THEN 410
250 T$=LEN(T$):IF T$=0 AND K$=SP$ THEN 390
260 IF CX<LM OR CX>RM THEN 630
270 IF CX<=T THEN 330
280 TS=TS+SPACE$(CX-T-1)+K$
290 CALL TEXTMODE(2):LOCATE 18,CX:PRINT K$;
300 CALL TEXTMODE(0):IF CX=RM-4 THEN SOUND 400,2
310 CX=CX+1:CX=CX+(CX=81)
320 LOCATE 20,8:PRINT CX:GOTO 200
330 IF NOT MD THEN 370

```

```

340 CALL TEXTMODE(2):LOCATE 18,CX:PRINT MID$(T$,CX,1);
350 T$=LEFT$(T$,CX-1)+K$+MID$(T$,CX+1)
360 LOCATE 18,CX:PRINT K$;:CALL TEXTMODE(0):GOTO 310
370 IF LEN(T$)>=RM THEN 630
380 T$=LEFT$(T$,CX-1)+K$+MID$(T$,CX)
390 IF LEN(T$)=RM-4 THEN SOUND 400,2
400 CX=CX+1:CX=CX+(CX=81):GOTO 510
410 KS=INSTR(M$,K$):IF KS=0 THEN 630
420 ON KS GOTO 430,430,450,450,460,460,480,530,550,550
580,610,610,620,620,660,660,680,680,730
430 K=ASC(K$):CX=CX+(K=178)-(K=179)
440 CX=CX-(CX=0)+(CX=81):GOSUB 5000:GOTO 200
450 MD=NOT MD:GOSUB 3000:GOTO 200
460 IF CX<LM OR CX>LEN(T$) THEN 630
470 T$=LEFT$(T$,CX-1)+MID$(T$,CX+1):GOTO 510
480 IF CX<=LM OR CX=1 THEN 630
490 IF T$="" THEN CX=CX-1:GOSUB 5000:GOTO 200
500 T$=LEFT$(T$,CX-2)+MID$(T$,CX):CX=CX-1
510 GOSUB 5000
520 LOCATE 18,1:PRINT T$;LEFT$(CL$,80-LEN(T$)):GOTO 20
530 T=CX:FOR L=CX+1 TO 80:IF TB(L)=1 THEN CX=L:L=80
540 NEXT L:IF T=CX THEN 630 ELSE GOSUB 5000:GOTO 200
550 IF CX>=RM THEN 630
560 CALL TEXTMODE(2):LOCATE 15,LM:PRINT "L"
570 CALL TEXTMODE(0):LM=CX:GOSUB 1000:GOTO 200
580 LPRINT T$;
590 IF ST>1 THEN FOR L=1 TO ST-1:LPRINT:NEXT L
600 GOTO 730
610 LOCATE 24,1:END
620 IF CX>LM THEN 640
630 SOUND 600,4:GOTO 200
640 CALL TEXTMODE(2):LOCATE 15,RM:PRINT "R"
650 CALL TEXTMODE(0):RM=CX:GOSUB 2000:GOTO 200
660 ST=ST+1:IF ST=4 THEN ST=1
670 GOSUB 4000:GOTO 200
680 CALL TEXTMODE(2):LOCATE 16,CX
690 IF TB(CX)=1 THEN PRINT "T"
700 TB(CX)=ABS(NOT -TB(CX)):LOCATE 16,CX
710 IF TB(CX)=0 THEN PRINT SP$ ELSE PRINT "T"
720 CALL TEXTMODE(0):GOTO 200
730 TS=""":LOCATE 18,1:PRINT CL$
740 CX=LM:GOSUB 5000:GOTO 200
1000 LOCATE 20,43-(LM<10):PRINT LM
1010 CALL TEXTMODE(2):LOCATE 15,LM:PRINT "L"
1020 CALL TEXTMODE(0):RETURN
2000 LOCATE 21,43-(RM<10):PRINT RM
2010 CALL TEXTMODE(2):LOCATE 15,RM
2020 CALL TEXTMODE(0):PRINT "R":RETURN
3000 LOCATE 20,60
3010 IF NOT MD THEN PRINT "INSERT MODE":RETURN
3020 CALL TEXTFACE(1):PRINT "REPLACE MODE"
3030 CALL TEXTFACE(0):RETURN
4000 LOCATE 21,60:ON ST GOTO 4010,4020,4030
4010 PRINT "SINGLE SPACE":RETURN
4020 CALL TEXTFACE(1):PRINT "DOUBLE SPACE":GOTO 4040
4030 CALL TEXTFACE(1):PRINT "TRIPLE SPACE"
4040 CALL TEXTFACE(0):RETURN
5000 LOCATE 20,8:PRINT CX:RETURN
6000 DATA 178,179,185,184,182,235,8,9,194,241,13
6010 DATA 207,206,168,229,167,234,160,230,193
7000 DATA <Option>+<D>,Delete current character
7010 DATA <Option>+<L>,Set left margin
7020 DATA <Option>+<P>,Insert/replace mode
7030 DATA <Option>+<Q>,Quit
7040 DATA <Option>+<R>,Set right margin
7050 DATA <Option>+<S>,Change line spacing
7060 DATA <Option>+<T>,Set/clear tab
7070 DATA <Option>+<1>,Clear line
7080 DATA "<Option>+<,>",Move cursor left
7090 DATA <Option>+<.>,Move cursor right
7100 DATA <Backspace>,Backspace-delete
7110 DATA <Return>,Print Line
7120 DATA <Tab>,Move to next tab

```

Tandy Color Computer w/printer/Junior Typewriter

```
10 K$=INKEY$:IF K$="" THEN 10
20 PRINT K$;
30 PRINT#-2,K$;:GOTO 10
```

Tandy Color Computer w/printer/Electronic Typewriter

```
10 CLEAR 1000:DIM TB(81),M(6),N(8)
20 LM=1:RM=80:ST=1:MD=0:CX=1:WL=1:WR=30
30 FOR L=1 TO 81:TB(L)=0:NEXT L
40 FOR L=10 TO 70 STEP 10:TB(L)=1:NEXT L
50 SP$=CHR$(32):L$=SP$:FOR L=1 TO 79:L$=L$+SP$:NEXT L
60 CL$=LEFT$(L$,32):GD$="":FOR L=1 TO 8
70 GD$=GD$+"---"+CHR$(48+L):NEXT L
80 TS="COMMAND":M$="":FOR L=1 TO 7
90 K=ASC(MID$(T$,L,1))+32:M$=M$+CHR$(K):NEXT L
100 FOR L=1 TO 6:READ M(L):NEXT L
110 FOR L=1 TO 8:READ N(L):NEXT L
120 CLS:PRINT "<";CHR$(94);"> NEXT TAB";TAB(16);"<CLEAR"
130 PRINT "<ENTER> PRINT";TAB(16);"<-> CURSOR"
140 PRINT "PRESS DOWN ARROW; THEN PRESS ...";
150 FOR L=1 TO 8:READ A$
160 IF L>4 THEN PRINT@32*L-48,A$:GOTO 180
170 PRINT@32*(L+2),A$
180 NEXT L:PRINT@416,"COLUMN:”;CX
190 PRINT "LEFT MARGIN:";PRINT "RIGHT MARGIN:";
200 T$="":GOSUB 1080:GOSUB 2000
210 GOSUB 3000:GOSUB 5000:GOSUB 6000
220 GOSUB 7000:IF K<32 OR K=94 THEN 350
230 T=LEN(T$):IF T=0 AND K$=SP$ THEN 320
240 IF CX<LM OR CX>RM THEN SOUND 100,4:GOTO 220
250 IF CX<=T THEN 290
260 T$=T$+LEFT$(L$,CX-T-1)+K$:IF CX=WR THEN 330
270 PRINT K$:IF CX=RM-4 THEN SOUND 100,1
280 CX=CX+1:PRINT@423,CX:GOTO 220
290 IF MD THEN T$=LEFT$(T$,CX-1)+K$+MID$(T$,CX+1):GOTO
```

330
300 IF LEN(T\$)>=RM THEN SOUND 100,4:GOTO 220

310 T\$=LEFT\$(T\$,CX-1)+K\$+MID\$(T\$,CX)
320 IF LEN(T\$)=RM-4 THEN SOUND 100,1
330 CX=CX+1:CX=CX+(CX=81)
340 GOSUB 1000:GOSUB 4000:GOTO 220
350 KS=0:FOR L=1 TO 6:IF M(L)=K THEN KS=L:L=6
360 NEXT L:IF KS=0 THEN SOUND 100,4:GOTO 220
370 ON KS GOTO 380,380,400,420,440,470
380 CX=CX+(K=8)-(K=9)
390 CX=CX-(CX=0)+(CX=81):GOSUB 1000:GOTO 220
400 PRINT#-2,TS
410 IF ST>1 THEN FOR L=1 TO ST-1:PRINT#-2:NEXT L
420 Z\$="":T\$="":PRINT@352,CLS\$;
430 CX=LM:GOSUB 1000:GOTO 220
440 T=CX:FOR L=CX+1 TO 80:IF TB(L)=1 THEN CX=L:L=80
450 NEXT L:IF T=CX THEN SOUND 100,4:GOTO 220
460 GOSUB 1000:GOTO 220
470 PRINT@499,M\$;
480 GOSUB 7000:K=K-32*(K>96)*(K<123)
490 KS=0:FOR L=1 TO 8:IF N(L)=K THEN KS=L:L=8
500 NEXT L:IF KS=0 THEN 730
510 ON KS GOTO 520,550,580,590,630,640,680,700
520 IF CX<=LM OR CX=1 THEN 730
530 IF T\$="" THEN CX=CX-1:GOSUB 1000:GOTO 220
540 T\$=LEFT\$(T\$,CX-2)+MID\$(T\$,CX):CX=CX-1:GOTO 570
550 IF CX<LM OR CX>LEN(T\$) THEN 730
560 T\$=LEFT\$(T\$,CX-1)+MID\$(T\$,CX+1)
570 GOSUB 1000:GOSUB 4000:GOTO 740
580 MD=NOT MD:GOSUB 2000:GOTO 740
590 IF CX>=RM THEN 730
600 IF LM<WL OR LM>WR THEN 620
610 PRINT@256+LM-WL,SP\$;
620 LM=CX:GOSUB 5000:GOTO 740
630 PRINT@480,"";END
640 IF CX<=LM THEN 730
650 IF RM<WL OR RM>WR THEN 670
660 PRINT@256+RM-WL,SP\$;
670 RM=CX:GOSUB 6000:GOTO 740



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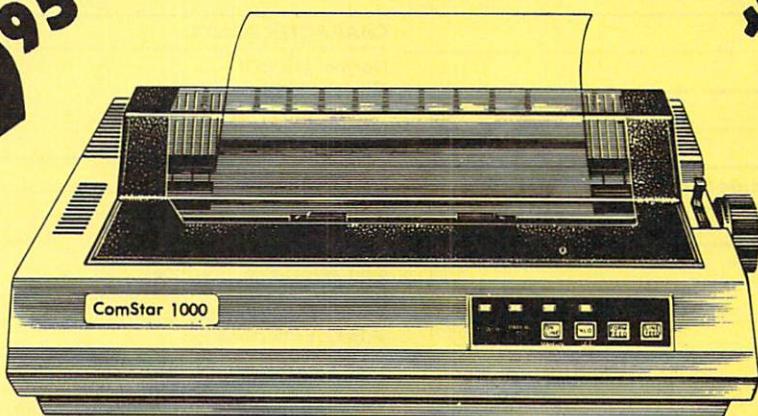
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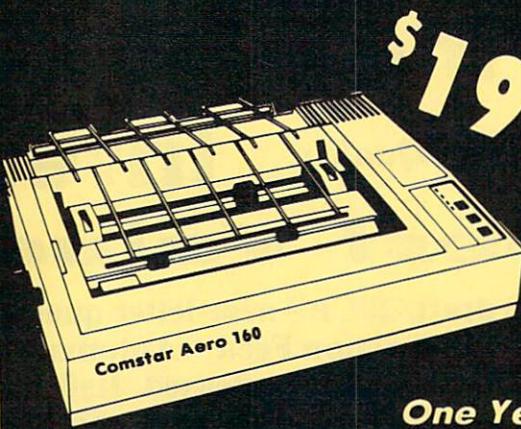
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HOME HELPER PROGRAM

```

680 ST=ST+1:IF ST=4 THEN ST=1
690 GOSUB 3000:GOTO 740
700 TB(CX)=ABS(NOT -TB(CX))
710 IF TB(CX)=0 THEN PRINT@288+CX-WL,SP$;:GOTO 740
720 PRINT@288+CX-WL,"T";:GOTO 740
730 SOUND 100,4
740 PRINT@499,LEFT$(CL$,7);:GOTO 220
1000 PRINT@423,CX;SP$;
1010 IF CX>WL AND CX<=WR THEN RETURN
1020 PRINT@256,CL$;:IF CX<WL THEN 1050
1030 WR=CX+10:IF WR>80 THEN WR=80
1040 WL=WR-31:GOTO 1070
1050 WL=CX-10:IF WL<1 THEN WL=1
1060 WL=WL+31
1070 PRINT@288,CL$;
1080 FOR L=WL TO WR:IF TB(L)=0 THEN 1100
1090 PRINT@288+L-WL,"T";
1100 NEXT L:GOSUB 4000
1110 PRINT@320,MID$(GD$,WL,32);
1120 PRINT@384,MID$(GD$,WL,32);
1130 GOSUB 5010:GOSUB 6010:RETURN
2000 IF MD THEN PRINT@435,"REPLACE MODE";:RETURN
2010 PRINT@435,"INSERT MODE";:SP$;:RETURN
3000 ON ST GOTO 3010,3020,3030
3010 PRINT@467,"SINGLE SPACE";:RETURN
3020 PRINT@467,"DOUBLE SPACE";:RETURN
3030 PRINT@467,"TRIPLE SPACE";:RETURN
4000 T=LEN(T$):IF T<WL THEN Z$="":GOTO 4030
4010 IF T<WR THEN Z$=MID$(T$,WL,T-WL+1):GOTO 4030
4020 Z$=MID$(T$,WL,32)
4030 PRINT@352,Z$:LEFT$(CL$,32-LEN(Z$));:RETURN
5000 PRINT@462-(LM<10),LM;SP$;
5010 IF LM<WL OR LM>WR THEN RETURN
5020 PRINT@256+LM-WL,"L";:RETURN
6000 PRINT@494-(RM<10),RM;SP$;
6010 IF RM<WL OR RM>WR THEN RETURN
6020 PRINT@256+RM-WL,"R";:RETURN
7000 IF CX>LEN(T$) THEN C$=SP$ ELSE C$=MID$(T$,CX,1)
7010 K$=INKEY$:PRINT@352+CX-WL,CHR$(140);
7020 PRINT@352+CX-WL,C$;:IF K$="" THEN 7010
7030 PRINT@352+CX-WL,"";:K=ASC(K$):RETURN
8000 DATA 8,9,13,12,94,10
8010 DATA 66,68,73,76,81,82,83,84
9000 DATA <B> BACKSPACE,<D> DELETE
9010 DATA <I> INS/REPLACE,<L> LEFT MARGIN
9020 DATA <Q> QUIT,<R> RIGHT MARGIN
9030 DATA <S> SPACING,<T> SET/CLR TAB

```

Tandy Model III or 4 (Model III mode) w/printer/Junior Typewriter

```

10 K$=INKEY$:IF K$="" THEN 10
20 PRINT K$;:LPRINT K$;:GOTO 10

```

Tandy Model III or 4 (Model III mode) w/printer/Electronic Typewriter

```

10 CLEAR 1000:DIM TB(81),M(13)
20 LM=1:RM=80:ST=1:MD=0:CX=1:WL=1:WR=64
30 FOR L=1 TO 81:TB(L)=0:NEXT L
40 FOR L=10 TO 70 STEP 10:TB(L)=1:NEXT L
50 SP$=CHR$(32):CL$=STRING$(64,32)
60 L$=STRING$(80,32):GD$="":FOR L=1 TO 8
70 GD$=GD$+STRING$(9,45)+CHR$(48+L):NEXT L
80 FOR L=1 TO 13:READ M(L):NEXT L
90 CLS:READ A$,B$,C$,D$:PRINT A$,B$,C$
100 PRINT TAB(4);D$:FOR L=1 TO 5:READ A$,B$
110 PRINT TAB(8);A$:TAB(35);B$
120 NEXT L:PRINT@832,"COLUMN:";CX
130 PRINT@853,"LEFT MARGIN":PRINT@917,"RIGHT MARGIN:"
140 T$="":GOSUB 1080:GOSUB 2000
150 GOSUB 3000:GOSUB 5000:GOSUB 6000
160 IF CX>LEN(T$) THEN C$=SP$ ELSE C$=MID$(T$,CX,1)
170 K$=INKEY$:PRINT@704+CX-WL,CHR$(176);
180 PRINT@704+CX-WL,C$;CHR$(24);:IF K$="" THEN 170
190 K=ASC(K$):IF K<32 THEN 300
200 T=LEN(T$):IF T=0 AND K$=SP$ THEN 290
210 IF CX<LM OR CX>RM THEN 160

```

```

220 IF CX<=T THEN 260
230 T$=T$+LEFT$(L$,CX-T-1)+K$:IF CX=WR THEN 290
240 PRINT K$;
250 CX=CX+1:PRINT@840,CX;:GOTO 160
260 IF MD THEN T$=LEFT$(T$,CX-1)+K$+MID$(T$,CX+1):GOTO 290
270 IF LEN(T$)>=RM THEN 160
280 T$=LEFT$(T$,CX-1)+K$+MID$(T$,CX)
290 CX=CX+1:CX=CX+(CX=81):GOTO 410
300 KS=0:FOR L=1 TO 13:IF M(L)=K THEN KS=L
310 NEXT L:IF KS=0 THEN 160
320 ON KS GOTO 330,330,350,360,380,420,440,480,510,520
,560,580,610
330 CX=CX+(K=8)-(K=9)
340 CX=CX-(CX=0)+(CX=81):GOSUB 1000:GOTO 160
350 MD=NOT MD:GOSUB 2000:GOTO 160
360 IF CX<LM OR CX>LEN(T$) THEN 160
370 T$=LEFT$(T$,CX-1)+MID$(T$,CX+1):GOTO 410
380 IF CX<=LM OR CX=1 THEN 160
390 IF T$="" THEN CX=CX-1:GOSUB 1000:GOTO 160
400 T$=LEFT$(T$,CX-2)+MID$(T$,CX):CX=CX-1
410 GOSUB 1000:GOSUB 4000:GOTO 160
420 T=CX:FOR L=CX+1 TO 80:IF TB(L)=1 THEN CX=L:L=80
430 NEXT L:IF T=CX THEN 160 ELSE GOSUB 1000:GOTO 160
440 IF CX>=RM THEN 160
450 IF LM<WL OR LM>WR THEN 470
460 PRINT@512+LM-WL,SP$;
470 LM=CX:GOSUB 5000:GOTO 160
480 LPRINT T$;
490 IF ST>1 THEN FOR L=1 TO ST-1:LPRINT:NEXT L
500 GOTO 610
510 PRINT@896,"";:END
520 IF CX<=LM THEN 160
530 IF RM<WL OR RM>WR THEN 550
540 PRINT@512+RM-WL,SP$;
550 RM=CX:GOSUB 6000:GOTO 160
560 ST=ST+1:IF ST=4 THEN ST=1
570 GOSUB 3000:GOTO 160
580 TB(CX)=ABS(NOT -TB(CX)):PRINT@576+CX-WL,"";
590 IF TB(CX)=0 THEN PRINT SP$; ELSE PRINT "T";
600 GOTO 160
610 Z$="":T$="":PRINT@704,CL$;
620 CX=LM:GOSUB 1000:GOTO 160
1000 PRINT@839,CX;SP$;
1010 IF CX>WL AND CX<=WR THEN RETURN
1020 PRINT@512,CL$;:IF CX<WL THEN 1050
1030 WR=CX+10:IF WR>80 THEN WR=80
1040 WL=WR-63:GOTO 1070
1050 WL=CX-10:IF WL<1 THEN WL=1
1060 WL=WL+31
1070 PRINT@576,CL$;
1080 FOR L=WL TO WR:IF TB(L)=0 THEN 1100
1090 PRINT@576+L-WL,"T";
1100 NEXT L:GOSUB 4000
1110 PRINT@640,MID$(GD$,WL,64);
1120 PRINT@768,MID$(GD$,WL,64);
1130 GOSUB 5010:GOSUB 6010:RETURN
2000 IF MD THEN PRINT@876,"REPLACE MODE";:RETURN
2010 PRINT@876,"INSERT MODE";:SP$;:RETURN
3000 ON ST GOTO 3010,3020,3030
3010 PRINT@940,"SINGLE SPACE";:RETURN
3020 PRINT@940,"DOUBLE SPACE";:RETURN
3030 PRINT@940,"TRIPLE SPACE";:RETURN
4000 T=LEN(T$):IF T<WL THEN Z$="":GOTO 4030
4010 IF T<WR THEN Z$=MID$(T$,WL,T-WL+1):GOTO 4030
4020 Z$=MID$(T$,WL,64)
4030 PRINT@704,Z$:LEFT$(CL$,64-LEN(Z$));:RETURN
5000 PRINT@866-(LM<10),LM;SP$;
5010 IF LM<WL OR LM>WR THEN RETURN
5020 PRINT@512+LM-WL,"L";:RETURN
6000 PRINT@930-(RM<10),RM;SP$;
6010 IF RM<WL OR RM>WR THEN RETURN
6020 PRINT@512+RM-WL,"R";:RETURN
7000 DATA 8,9,16,4,2,14,12,13,17,18,19,20,31
8000 DATA "<CLEAR> Clear Line"
8010 DATA "<ENTER> Print Line"
8020 DATA <- OR -> Move cursor

```

```

8030 DATA Hold down <LEFT SHIFT> and <DOWN ARROW>; then press ...
8040 DATA <B> Backspace-delete,<Q> quit
8050 DATA <D> Delete character,<R> Set right margin
8060 DATA <L> Set left margin,<S> Line spacing
8070 DATA <N> Move to next tab
8080 DATA <T> Set/clear tab
8090 DATA <P> Insert/replace mode,""

```

VIC-20 w/printer/Junior Typewriter

```

10 OPEN 4,4
20 GET K$:IF K$="" THEN 20
30 PRINT K$,:PRINT#4,K$,:GOTO 20

```

VIC-20 w/5K or 8K RAM Cartridge & printer/Electronic Typewriter

```

10 DIM TB(81),M(13):POKE 650,128:OPEN 4,4
20 FOR L=36874 TO 36878:POKE I,0:NEXT L
30 POKE 36876,230
40 LM=1:RM=80:SM=1:MD=0:CX=1:WL=1:WR=21
50 FOR L=1 TO 81:TB(L)=0:NEXT L
60 FOR L=10 TO 70 STEP 10:TB(L)=1:NEXT L
70 BE$=CHR$(31):BL$=CHR$(144):RD$=CHR$(28)
80 SP$=CHR$(32):BK$=CHR$(18)+SP$+CHR$(146)+CHR$(157)
90 CL$=SP$:FOR L=1 TO 79:L$=L$+SP$:NEXT L
100 CL$=LEFT$(L$,21):GDS="":FOR L=1 TO 8
110 GD$=GDS+"-----"+CHR$(48+L):NEXT L
120 FOR L=1 TO 13:READ M(L):NEXT L
130 PRINT CHR$(147);:FOR L=1 TO 12:READ A$,B$
140 PRINT BL$;A$:TAB(9):BE$;B$:NEXT L
150 POKE 214,18:PRINT:PRINT "COL:":CX
160 PRINT "LM:":PRINT "RM:"
170 T$="":GOSUB 1080:GOSUB 2000
180 GOSUB 3000:GOSUB 5000:GOSUB 6000
190 C$=SP$:IF CX<=LEN(T$) THEN C$=MID$(T$,CX,1)
200 GET K$:POKE 214,16:PRINT
210 PRINT TAB(CX-WL);BK$;C$;CHR$(157);
220 IF K$="" THEN 200
230 K=ASC(K$):IF K<32 OR K>127 THEN 350
240 T=LEN(T$):IF T=0 AND K$=SP$ THEN 330
250 IF CX<LM OR CX>RM THEN 590
260 IF CX<=T THEN 300
270 T$=T$+LEFT$(L$,CX-T-1)+K$:IF CX=WR THEN 340
280 PRINT K$;:IF CX=RM-4 THEN DL=1:GOSUB 7000
290 CX=CX+1:POKE 214,18:PRINT:PRINT TAB(4):CX:GOTO 190
300 IF MD THEN T$=LEFT$(T$,CX-1)+K$+MID$(T$,CX+1):GOTO 340
310 IF LEN(T$)>=RM THEN 590
320 T$=LEFT$(T$,CX-1)+K$+MID$(T$,CX)
330 IF LEN(T$)=RM-4 THEN DL=1:GOSUB 7000
340 CX=CX+1:CX=CX+(CX=81):GOTO 450
350 KS=0:FOR L=1 TO 13:IF M(L)=K THEN KS=L:L=14
360 NEXT L:IF KS=0 THEN 590
370 ON KS GOTO 380,380,400,430,460,490,530,560,570,580
,630,650,680
380 CX=CX+(K=157)-(K=29)
390 CX=CX-(CX=0)+(CX=81):GOSUB 1000:GOTO 190
400 IF CX<=LM OR CX>1 THEN 590
410 IF T$="" THEN CX=CX-1:GOSUB 1000:GOTO 190
420 T$=LEFT$(T$,CX-2)+MID$(T$,CX):CX=CX-1:GOTO 450
430 IF CX<LM OR CX>LEN(T$) THEN 590
440 T$=LEFT$(T$,CX-1)+MID$(T$,CX+1)
450 GOSUB 1000:GOSUB 4000:GOTO 190
460 T=CX:FOR L=CX+1 TO 80:IF TB(L)=1 THEN CX=L:L=80
470 NEXT L:IF T=CX THEN 590
480 GOSUB 1000:GOTO 190
490 IF CX>=RM THEN 590
500 IF LM<WL OR LM>WR THEN 520
510 POKE 214,13:PRINT:PRINT TAB(LM-WL);SP$
520 LM=CX:GOSUB 5000:GOTO 190
530 PRINT#4,T$
540 IF SM>1 THEN FOR L=1 TO SM-1:PRINT#4:NEXT L
550 GOTO 680
560 MD=NOT MD:GOSUB 2000:GOTO 190
570 PRINT#4:CLOSE 4:POKE 214,22:PRINT:END

```

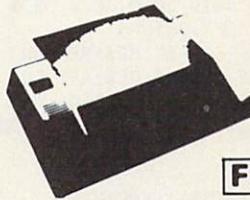


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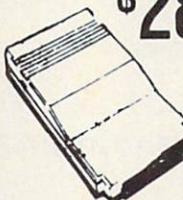
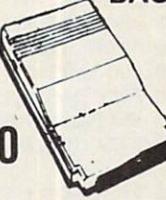
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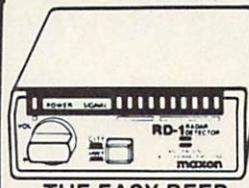
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AUGUST 1986 59

HOME HELPER PROGRAM

```
580 IF CX>LM THEN 600
590 DL=3:GOSUB 7000:GOTO 190
600 IF RM<WL OR RM>WR THEN 620
610 POKE 214,13:PRINT:PRINT TAB(RM-WL);SP$
620 RM=CX:GOSUB 6000:GOTO 190
630 SM=SM+1:IF SM=4 THEN SM=1
640 GOSUB 3000:GOTO 190
650 TB(CX)=ABS(NOT -TB(CX)):POKE 214,14:PRINT
660 IF TB(CX)=0 THEN PRINT TAB(CX-WL);SP$:GOTO 190
670 PRINT TAB(CX-WL);RD$;"T";BE$:GOTO 190
680 Z$="":T$="":POKE 214,16:PRINT:PRINT CL$;
690 CX=LM:GOSUB 1000:GOTO 190
1000 POKE 214,18:PRINT:PRINT TAB(4);STR$(CX);SP$
1010 IF CX>WL AND CX<WR THEN RETURN
1020 POKE 214,13:PRINT:PRINT CL$:IF CX<WL THEN 1050
1030 WR=CX+10:IF WR>80 THEN WR=80
1040 WL=WR-20:GOTO 1070
1050 WL=CX-10:IF WL<1 THEN WL=1
1060 WR=WL+20
1070 POKE 214,14:PRINT:PRINT CL$;
1080 FOR L=WL TO WR:IF TB(L)=0 THEN 1100
1090 POKE 214,14:PRINT:PRINT TAB(L-WL);RD$;"T";BE$;
1100 NEXT L:GOSUB 4000
1110 POKE 214,15:PRINT:PRINT BL$:MID$(GD$,WL,21);BE$;
1120 POKE 214,17:PRINT:PRINT BL$:MID$(GD$,WL,21);BE$;
1130 GOSUB 5020:GOSUB 6020:RETURN
2000 POKE 214,18:PRINT
2010 IF MD THEN PRINT TAB(9);BL$;"REPLACE MODE";BE$:RE
TURN
2020 PRINT TAB(9);"INSERT MODE";SP$:RETURN
3000 POKE 214,19:PRINT:ON SM GOTO 3010,3020,3030
3010 PRINT TAB(9);"SINGLE SPACE":RETURN
3020 PRINT TAB(9);BL$;"DOUBLE SPACE";BE$:RETURN
3030 PRINT TAB(9);BL$;"TRIPLE SPACE";BE$:RETURN
4000 T=LEN(T$):IF T<WL THEN Z$="":GOTO 4030
4010 IF T<WR THEN Z$=MID$(T$,WL,T-WL+1):GOTO 4030
4020 Z$=MID$(T$,WL,21)
4030 POKE 214,16:PRINT
4040 PRINT Z$;LEFT$(CL$,21-LEN(Z$));:RETURN
5000 POKE 214,19:PRINT
5010 PRINT TAB(3-(LM<10));STR$(LM);SP$
5020 IF LM<WL OR LM>WR THEN RETURN
5030 POKE 214,13:PRINT
5040 PRINT TAB(LM-WL);RD$;"L";BE$:RETURN
6000 POKE 214,20:PRINT
6010 PRINT TAB(3-(RM<10));STR$(RM);SP$
6020 IF RM<WL OR RM>WR THEN RETURN
6030 POKE 214,13:PRINT
6040 PRINT TAB(RM-WL);RD$;"R";BE$:RETURN
7000 FOR L=15*DL TO 0 STEP -0.5
7010 POKE 36878,L/DL
7020 NEXT L:RETURN
8000 DATA 157,29,20,172,162,182,13,148,171,178,174,163
,19
9000 DATA <C=>+<D>,DELETE CHAR
9010 DATA <C=>+<I>,TO NEXT TAB
9020 DATA <C=>+<L>,LEFT MARGIN
9030 DATA <C=>+<Q>,QUIT,<C=>+<R>,RIGHT MARGIN
9040 DATA <C=>+<S>,LINE SPACING
9050 DATA <C=>+<T>,SET/CLR TAB
9060 DATA <DEL>,BACKSPACE
9070 DATA <RETURN>,PRINT LINE,<HOME>,CLEAR LINE
9080 DATA <INST>,INST/REPLACE
9090 DATA <- OR ->,MOVE CURSOR
```

PROGRAMMING P.S.

Corrections to Previous Months' Programs

Fox and Geese (March 1986, page 66)

Apple II series w/48K RAM: When typing in this program, make sure not to add any REM statements or other extra lines. (If you do, the program and its variables will be too large to fit in the area of memory normally reserved for programs and will start to run over into the area where the first high-res screen is stored.)

Also, the program as published allowed the fox to make certain illegal moves in a multiple jump and did not handle the endgame correctly. To fix these problems, change lines 330, 580, 600, 610, 790, 1160, 10020 and 10030 to read as follows:

```
330 IF NL = 0 THEN 1140
580 IF DC > 1 THEN 620
600 PRINT "YOU'VE FORFEITED YOUR DECLARATION.";BP$;
610 GOSUB 11000:DC = 0:GOTO 550
790 IF DC THEN DC = DC+1:GOTO 320
1160 GOTO 1240
10020 IF X = 0 AND Y = 0 THEN 10060
10030 GB = GB+(Y >= FY)
```

Letter Getter (May 1986, page 52)

Adam: Due to a printing error, the "i" letters in lines 50, 150, and 270 weren't dotted. They are, indeed, lowercase "i" 's.

Maze Creator (May 1986, page 55)

Macintosh w/printer & Microsoft BASIC 2.0 or 2.1: The third line of the SET.LEVEL subroutine (the 60th line in the left-hand column on page 66) should have been printed in red. Here's that line again:

```
CLS:PRINT TAB(7);"Do you want to print a copy ";
```

If you don't have a printer, you should omit this line along with the lines that were printed in red.

Tandy Color Computer w/64K RAM & printer: A printer's error introduced a splotch in line 4100 (used in option 4 for the CoCo). Here's that line again, without splotches:

```
4100 PRINT#-2,CHR$(27);"K";CHR$(FB);CHR$(LB);
```

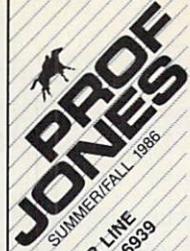
Also, line 570 should have been printed in red. If you don't have a printer, omit this line along with the lines that were printed in red.

TIPS TO THE TYPIST

Typing in FAMILY COMPUTING's programs is a great way to become familiar with your computer and get some free software "to boot." But it's frustrating to type in a long program, only to find it doesn't work as it should. When this happens, simple typing errors are most often the cause. So to help you gain greatest value from the time you spend computing with us, we've put together some tips on how to avoid typing errors—and what to do if a program doesn't run right. Read them carefully, and you'll be up and running in no time!

SOME GENERAL RULES

- 1.** **Do** read instructions and program headings carefully. Make sure your computer has enough memory, the right version of BASIC, and the appropriate peripherals (joysticks, printers, disk drives, etc.) for a program.
- 2.** **Don't** let fatigue and boredom contribute to inaccuracy. If you're new to programming, try typing in shorter programs first. Type in a longer program in easy stages, **SAVING** each installment as you go.
- 3.** Until you are fairly familiar with BASIC, **do** assume that every word, number, letter, space, and punctuation mark in a program listing must be copied accurately if the program is to function as intended.
- 4.** **Do** watch out for potential trouble spots. About 90 percent of all typing errors occur in DATA statements: long lines filled with numbers or incomprehensible secret codes. If possible, have someone else read DATA to you as you type, and help you proofread it if you have trouble later on. Proofreading from a printout is best.
- 5.** **Do** be aware that program listings printed in FAMILY COMPUTING sometimes differ from what you will see on your computer's screen or in printouts you produce at home. Our program listings are printed 54 characters wide. Thus, a single BASIC program "line" (sometimes called a "logical line") may appear as several lines in our listing. If you are typing along and reach the right margin of the printed listing, don't press RETURN or ENTER until you've checked to see if the program "line" you're typing really ends there. The way to tell is to check if the line following begins with a multiple of 10 that follows in sequence from the previous logical line. REM statements are the exception, and typing them in is optional.
- Several computers (Adam, Apple, Atari, and TI) format BASIC programs according to unique rules of their own. Don't let this throw you—just type in the listing exactly as printed in the magazine and your computer is guaranteed to accept it, even though it may end up looking a little different on your screen.
- 6.** One foolproof way to correct an error in a BASIC program line is to type the line in again from the beginning, and press RETURN or ENTER to set it in place of the old one in your computer's memory.



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APPLE HARMONY

BY POPULAR DEMAND: THIS EASY-TO-USE MACHINE-LANGUAGE PROGRAM LETS YOUR APPLE SING OUT—IN HARMONY!

BY JOHN JAINSCHIGG



It's no secret that FAMILY COMPUTING's technical staff loves music. Putting together K-POWER's monthly Microtones feature is some of the best fun we have, and from the cards and letters we've received, we know you enjoy it, too!

Unfortunately, after each issue comes out, there are almost always a few disappointed notes from musically inclined Apple readers inquiring why we didn't present this or that composition for their machines.

The answer, we're sad to say, is that in the past, the Apple's limited sound capabilities seemed to put sophisticated music out of reach.

No more. Your letters have inspired us to keep on hammering away at the Apple music problem, and we're proud to inform you that *Apple Harmony*, our second-generation Apple music routine, is now ready. *Apple Harmony* is

a machine-language subroutine that generates musical tones through the Apple's tiny speaker. Like other Apple music subroutines we've published (see "Let Your Apple Sing," in *Helpful Hints*, April 1985, for an example), *Apple Harmony* is easy to incorporate into BASIC programs. But unlike subroutines that can only play single notes, *Apple Harmony* can also play chords of up to three notes with reasonable fidelity!

Our demo program, below, shows off *Apple Harmony* playing an arrangement of the old favorite, "In the Good Old Summertime." If you're eager to hear the music, go ahead and type in the program (remember to SAVE it on disk or cassette before typing RUN). Then read on to learn how to make your own music programs with *Harmony*.

ESSENTIALS OF APPLE SOUND

It's hard to get anything that sounds like music out of the standard Apple II—especially when more than a single melody line is required. Apple owners who hanker for studio-quality sound or yearn to use their computers for music composition or arranging can, of course, take advantage of third party hardware products that turn the Apple into a first-rate musician's tool. (See the "1986 Buyer's Guide to Music Hardware and Software" in this issue.)

Unless you have access to special hardware, however, the only way to produce sound on an Apple is through the internal speaker. Control of the speaker is very rudimentary. By examining or changing the contents of memory location 49200

(using a PEEK or POKE statement, or equivalent), you can pop the speaker cone in or out, causing a little "click." That's it.

It's possible to create simple sound effects by clicking the speaker at different rates of speed. The BASIC program below will let you experiment with some of the possibilities. Try entering different numbers at the "RATE?" prompt. Larger numbers slow down the rate at which the speaker is clicked, making a lower-pitched sound. Smaller numbers speed it up, making a higher-pitched sound.

```
10 INPUT "RATE?"; R
20 FOR I = 1 TO 200
30 A = PEEK(49200)
40 FOR D = 1 TO R
50 NEXT D
60 NEXT I
```

Unfortunately, no matter how small a number you enter, BASIC simply isn't fast enough to produce "musical" tones in the above manner. That's not really surprising when you realize that notes produced by a piano range between about 55 vibrations per second to about 8,372 vibrations per second. That's fast!

Machine code is fast enough to click the speaker at these rates of speed, but a simple machine-language routine can only produce one tone at a time. Chords, consisting of multiple frequencies all combined together, are much more difficult to generate. As Figure 1 shows, a click pattern re-

producing the combined frequencies of a three-note chord is pretty complicated—too complicated, it turns out, for even the Apple's 6502 chip to manage.

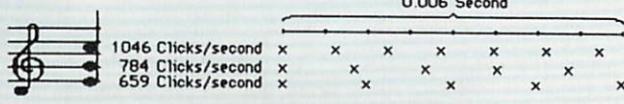
The answer, it turns out, is to fall back on the wonderful properties of the human ear. If you've ever listened carefully to someone playing chords on a banjo or mandolin, you realize that even though the individual notes of those chords don't sound simultaneously, the effect of the chord comes through. Why? Because the player strums the chord repeatedly, fast enough to create the impression that each note is sounding continuously. In musical terminology, producing a chord by playing each of its notes in sequence is called arpeggiation.

Using rapid arpeggiation, *Apple Harmony* can play chords in a very acceptable manner. The strumming effect is a bit unusual—perhaps not suitable for all kinds of music. Some FAMILY COMPUTING staff members described the bubbly sound as "a computer singing under water." But it sounds good enough for us to experiment further. We hope you will, too. Here's how.

USING APPLE HARMONY

The first step to using *Apple Harmony* with a BASIC program is to put *Harmony*'s machine code in your Apple's memory. The machine code is contained in DATA statements

Figure 1.



Click Pattern for a Typical 3-Note Chord

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FEATURE PROGRAM

Table 1.

	Higher	←	→	Lower
C	13	28	57	118 242
B	14	30	61	124
A# / Bb	15	31	64	130
A	16	33	68	138
G# / A#	17	35	72	146
G	18	37	76	156
F# / G#	19	40	82	163
F	20	42	88	172
E	21	45	94	186
D# / E#	23	48	99	200
D	24	51	106	214
C# / D#	26	54	112	227

Pitch Values for Apple Harmony

at lines 1000-1060 of the demo program, below, and is read in and stored in an unused place in memory by line 10. To use *Harmony* in your own programs, just make these lines a part of your listing, renumbering as necessary. If your program reads in other data, make sure your READ and DATA statements don't conflict with *Harmony*'s.

Once *Harmony* is in memory, playing notes and chords is easy. You

from 1 to 255 into memory location 9. The larger the number, the longer your note or chord will play. Table 2, below, shows some numeric equivalents for standard musical durations.

Once you've set your pitch(es) and duration, play the note or chord with this statement: CALL 768. This tells your Apple to execute *Harmony*'s machine code, stored starting at location 768 in memory.

PROGRAMMING REAL MUSIC

Using *Apple Harmony*, it's easy to write programs that play fairly sophisticated music. In fact, you can substitute your own music for that in our demo program, below, by following these simple steps:

1) Convert each of the chords in your tune to a

while another is changing.)

3) Delete lines 2000-2170 of the demo program, and substitute your own music data as follows. Each chord is represented by three pitch values (zeros included, for resting voices) and a duration value, all separated by commas, thus: pitch, pitch,pitch,duration, pitch,pitch,pitch, duration . . . etc.

4) Count the chords in your song, and assign that value to N in line 20. "In the Good Old Summertime" contains 54 chord groups. If your tune contained 25, you would change line 20 so that it reads:

20 N = 54

And that's it! SAVE your composition on disk or cassette, and type RUN. If there's a problem, check

your DATA statements. You may have miscounted the number of chord groups in your song or failed to represent each of them with three pitch values (including those zeros!) and a duration value.

If you'd like to experiment further, changing the value of variable RT (for rate) in line 30 will modify the speed at which *Apple Harmony* arpeggiates (strums) each of your chords. Making RT smaller will speed up the arpeggiation (it's easy to create a distorted sound this way), while making it larger will slow the strumming down. Changing the value of variable TE (tempo), in line 40 will speed up or slow down the music's overall tempo. Make TE 0.5 to double the speed, or make it 2 to cut the speed in half. Happy music making!

Figure 2.



In the good old Sum-mer-time . . .

High Voice	37	33	37	45	37	28	21
Middle Voice	0	0	45	0	45	0	31
Low Voice	0	0	0	0	57	0	37
Duration	4	4	8	4	8	4	16

Transcription Example

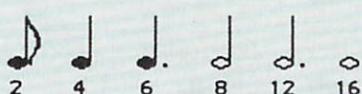
control the pitch of notes you want to play by POKE-ing numbers from Table 1 into memory locations 6, 7, and 8. Using one, two, or all three of these locations will let you play a single note, a diad (two-note chord), or a triad (three-note chord). POKE zeros (the "rest value") into any of the three locations you don't use so that *Harmony* doesn't think those "voices" are active.

Controlling how long you want your note or chord to sound is equally easy. Just POKE a number

list of 3 numbers, according to Table 1. If one or more of the voices doesn't sound (rests) for part of the song, put a zero (the rest value) in to mark the place. The first few measures of our demo tune, "In the Good Old Summertime," are converted as shown in Figure 2.

2) Convert the duration of each chord to a corresponding value, using Table 2. (Note: When transcribing your music, keep in mind that Apple Harmony can only play chords one after another; it can't hold out one note

Table 2.



Some Approximate Duration Values ($\text{♩} = 120$)

Apple II Series/Apple Harmony

```

10 FOR I = 768 TO 846:READ A:POKE I,A:NEXT I
20 N = 54
30 RT = 2
40 TE = 1
50 POKE 847,RT*2:POKE 848,RT*6
60 POKE 849,RT*3:POKE 850,RT*2
70 FOR I = 1 TO N
80 READ N1,N2,N3,DR
90 POKE 6,N1:POKE 7,N2:POKE 8,N3:POKE 9,DR*TE
100 CALL 768
110 NEXT I
120 END
999 REM --MACHINE LANGUAGE DATA--
1000 DATA 160,2,162,0,185,6,0,240,1,232,136,16
1010 DATA 247,189,79,3,141,45,3,142,85,3,162,2
1020 DATA 181,6,208,5,172,85,3,208,3,32,44,3
1030 DATA 202,16,241,198,9,208,235,96,160,0,140,83
1040 DATA 3,160,255,140,84,3,168,240,3,141,48,192
1050 DATA 206,84,3,208,3,206,83,3,136,192,255,208
1060 DATA 243,172,83,3,208,232,96
1999 REM --MUSIC DATA--
2000 DATA 37,0,0,4,33,0,0,4,37,45,0,8
2010 DATA 45,0,0,4,37,45,57,8,28,0,0,4
2020 DATA 21,31,37,16,24,33,42,4,28,31,45,4
2030 DATA 28,33,42,8,24,35,45,4,28,33,42,8
2040 DATA 33,0,0,4,37,45,57,24,45,58,0,8
2050 DATA 37,0,0,4,28,45,76,8,24,0,0,4
2060 DATA 21,30,35,12,28,33,45,12,24,33,40,8
2070 DATA 21,0,0,4,24,33,40,8,21,0,0,4
2080 DATA 24,30,37,20,37,0,0,4,45,57,0,8
2090 DATA 37,0,0,4,28,45,76,8,24,0,0,4
2100 DATA 21,28,31,8,24,30,35,4,28,31,37,8
2110 DATA 28,37,45,4,28,33,42,8,24,35,45,4
2120 DATA 28,33,42,4,33,42,0,4,28,33,42,4
2130 DATA 37,45,57,20,42,0,0,4,45,57,0,8
2140 DATA 37,0,0,4,28,45,76,8,24,0,0,4
2150 DATA 21,30,35,12,28,33,0,4,30,35,0,4
2160 DATA 28,33,0,4,24,33,40,8,33,0,0,4
2170 DATA 21,30,37,8,24,30,42,4,28,37,45,16

```

The **FAMILY COMPUTING**

Guide To Computer Accessories

**What They Do,
Why You Need Them,
What's Available,
and Where to Get Them.**

Find Answers Here.

Getting a new computer is a lot like bringing home a puppy. Although you won't need to housebreak the little machine, there are a number of parallels between the two. One, just as you'd arrange a comfortable corner for the puppy's naptime, you'll want a comfortable computer setup for your work time. Two, just as you'd take the puppy to a veterinarian to insure its good health, you'll want to maintain your computer's health (that's where items like surge protectors and disk boxes come in). And three, just as you'd need a supply of dog food to feed the growing beast, you'll need a supply of floppy disks, computer paper, and printer ribbons to feed your new computing habits.

Now at its best, using your new computer can also be as much fun as playing with a puppy, but too often problems get in the way. Problems such as disks that stop working, so a favorite game or important data gets lost. Annoyances like no more ribbons for the printer when it's one in the morning and a project is due. Headaches such as losing the last 12 pages you wrote when you return to the computer after a break, and a static shock that jumps from your hand to the machine zaps your file (and a few chips) into oblivion. Or worse, you get real headaches after working at the monitor for a few hours.

When you want solid answers to troubles like these, you'll want to know about computer accessories.

Three Good Reasons For Buying Computer Accessories

■ MAINTENANCE. It makes good sense to take care of an expensive object like a computer. When you extend the time between repairs, you can save a chunk of money. Maintaining the work you do is vital as well. After all, you'd hate to see your child's painstakingly crafted school report vanish into the ozone because a bolt of lightning induced an uncontrolled surge of electricity into the computer.

■ ERGONOMICS. Webster's Ninth New Collegiate Dictionary defines ergonomics as, "An applied science concerned with the characteristics of people that need to be considered in designing and arranging things that they use in order that people and things will interact most effectively and safely—called also *human engineering*." Whew!

Simply put, ergonomic considerations mean that you want to place your body in the best position to operate a machine, while maintaining both comfort and efficiency. That's why furniture designed for the physical demands of computing can mean the difference between a relaxing session at your computer or fatigue and actual discomfort.

Ergonomics is convenience too. For instance, the layout of a keyboard is an ergonomic consideration in both designing a computer and purchasing one.

■ SAVING TIME AND MONEY. When it comes to supplies, planning ahead can save you time and money. Find out what's available in disks, paper, and ribbons, and buy in quan-

ity when you can; the unit cost invariably goes down. Always purchase the best quality you can afford, too; off-brand disks, computer paper, and ribbons can leave behind particles and other debris that may harm your disk drives or printer.

Maintenance

■ DISK BOXES. The first law of computer maintenance reads: "Keep it clean." Using some type of disk box for storage will help your disks stay as dirt- and dust-free as possible. What harm can dirt do? It may result in lost programs or data, that's all.

There's a wide range of available disk boxes in various sizes. Some will hold three to five floppies, perfect for carrying disks from place to place. The next size up holds a dozen disks; it's often called a library case and is especially good for storing backups. Other disk boxes are designed to sit on your desk with room for anywhere from 15 to 120 disks. While most disk boxes are made of sturdy plastic, there are also some attractive wooden ones out there. If your privacy is important, you should have no trouble finding a selection of disk boxes with locks.

■ SURGE PROTECTOR. Have your lights at home ever flickered momentarily? Sure they have; you've experienced a power surge. A surge protector can help prevent power line disturbances, also called "transient voltage surges and spikes," from harming your computer's electronic circuitry. Many surge protectors also filter out electrical noise, such as EMI (electro-magnetic interference) and RFI (radio frequency interference). Such "dirty" electricity can cause a host of problems, such as the loss of data in memory, errors when saving files or printing out, chip failures, or other difficulties.

What causes these fluctuations of power? Lightning, for one thing, or abnormal electric delivery from your local utility. EMI or RFI can be caused by other electronic devices on the same line, and surges can result when a heavy motor, such as one in an air conditioner or refrigerator, comes on. To different degrees, these problems are common everywhere.

When buying a surge protector, you'll want at least one outlet in the protector for each item in your system: computer, monitor, printer, modem, etc. You'll find two levels of surge protectors. The first level protects against surges and spikes alone, while the better ones add EMI-RFI filtering. Other features to look for are circuit breakers and indicator lights that show whether it's functioning properly.

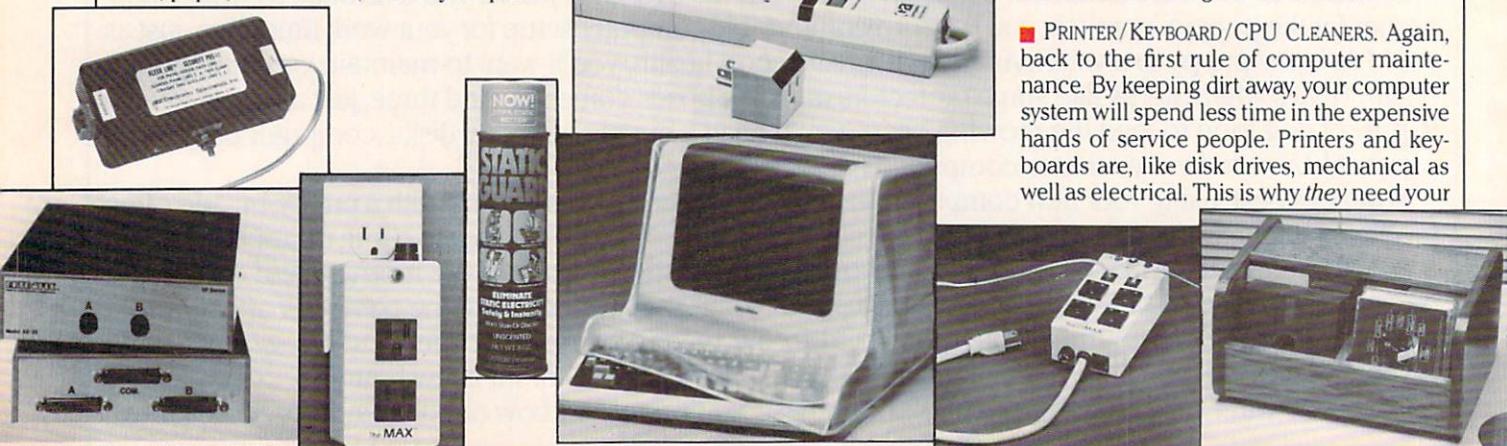
■ MODEM LINE PROTECTOR. Since the telephone line is simply a specialized electrical line, it needs similar electronic insurance. A modem line protector can help you eliminate the "glitches" that can occur when sending or receiving data with your modem.

■ DUST COVERS. In proportion to dollars spent, a cover will save you more money in the long-run than any other computer accessory. All you have to do is remember to cover your computer, monitor, printer, etc. when you're done for the day, and you'll endure far fewer breakdowns. If you're uncertain of what you want, start off with inexpensive vinyl covers (look for anti-static ones). Also available are attractive cloth covers in a broad palette of colors.

■ DISK DRIVE CLEANER. There are two schools of thought when it comes to cleaning disk drives. There's the "Machines Work Better When They're Clean" school vs. the classic philosophy of "If It Ain't Broken, Don't Fix It." Well what's classic may not always work in the modern world of electronics. As your drive's head reads or writes information, it touches the rapidly spinning disk, rubbing off minute particles of oxide. Just as with an audio tape recorder, cleaning the heads provides more accurate results. Other contaminants—such as smoke or dust—often find their way into your drives, too.

How often do you need to clean your drive heads? It depends on frequency of use. In a survey of service technicians, the average recommended time between cleanings was 52.7 hours of computer use. In figuring out how often to clean your drive heads, consider how much dust or smoke is in the air and how disk-intensive your computer activities are. Cleaning your drives every six months is another good rule-of-thumb.

■ PRINTER/KEYBOARD/CPU CLEANERS. Again, back to the first rule of computer maintenance. By keeping dirt away, your computer system will spend less time in the expensive hands of service people. Printers and keyboards are, like disk drives, mechanical as well as electrical. This is why *they* need your



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Dear Vikki,

You may not remember me, but I'm Jeff, the guy who unplugged your PC at Booth 153 B during The Hacker's Convention last month. I can't blame you for getting mad. It was a pretty dumb thing to do, but I was just trying to get your attention. I hope you won't . . .

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attention, whereas the microprocessor (or any other all-electronic part) doesn't. While you don't need to clean these devices as often as you might clean drive heads, the time spent will be well invested.

■ **ANTI-STATIC PRODUCTS.** This group of problem solvers consists of mats, sprays, and touch pads. The problem? Static electricity. What can it do? Zap away data and harm delicate chips. The solution? Begin by examining your computer's environment. Generally, the drier the air, the greater the static problems. An anti-static mat placed under the computer, and touched each time you sit down at the computer, will help dissipate static charges. Carpeting is another source for static electric charges. If you can't replace the carpet with wood or vinyl, try one of the sprays that can reduce the chances for static. And don't forget that anti-static elements in screen cleaners make dust settle less quickly on your monitor.

■ **COMPUTER FAN.** While many computers come with fans that help cool circuit boards, some (most notably the Apple II series) do not. Especially if you've added more than a couple boards to the expansion slots, a fan will save more money than it costs by giving you greater reliability and durability. When shopping, you'll also find fans combined with surge protectors.

■ **UNINTERRUPTABLE POWER SUPPLY.** Often called by its initials, UPS, this electronic box will, in the event of a blackout, either maintain or cut in and deliver full power to your computer for up to 30 minutes, enough time to power down and save all your information.

Do you live in an area where the electricity isn't always reliable? Or is your data so vital that you couldn't afford to lose it should a blackout occur? Then consider a UPS. However, they're not inexpensive; one can cost about \$400 up to \$2,000 or more. As you go up in price, you gain more wattage. Check the wattage requirements of all your components (computer, printer, monitor, etc.) to find how much power you need.

■ **CABLES AND CONNECTORS.** The correct cable can solve problems fast. For example, a friend bought a cheap replacement cable to connect her Apple IIc with an ImageWriter printer. She began losing characters when trying to print with her word processor, and

couldn't figure out why. Eventually, she discovered that her "bargain" cable was misconnected on one of its pins. Quality is a determining factor here. Gold-plated pins on the connector provide the best conductivity and the fewest data errors. You'll want your cable's connections to be soldered together (instead of crimped) for greater durability. Also, look for cables that are fully shielded from EMI-RFI emissions; ones that are not can cause havoc with disk drives or monitors.

■ **SWITCH BOXES.** There are different types of data switch boxes, but conceptually they're all alike. One will allow you to use two printers with one computer. Another lets you plug one printer into two computers. A third type will allow you to attach a modem and a printer to one serial port. The ports in data switch boxes are either Centronics parallel, serial, or a combination. This hardware helps maintain your system because without one, you'd be plugging and unplugging peripherals all the time, which would make the connectors wear out more rapidly. In addition, a switch box's function as an ergonomic convenience makes it worth getting if yours is one of the multiple peripheral situations listed above.

■ **LOCKS.** As valuable objects, computers have become a favorite of smart thieves everywhere. Whether for office or dormitory, computer locks are the easiest way to prevent unauthorized "access" to your computer.

Ergonomics

■ **FURNITURE.** Sometimes called a "work station," the correct table, chair, and light can make a big difference in your computing comfort. What does "correct" mean here? To begin with, the table or desk where the keyboard sits should be 26½" high, give or take an inch. Ergonomists have determined that this is the best height for typing desks. Make sure the table has enough extra space for papers and the like; a good sized table would measure about 26" high x 24" deep x 48" wide.

An adjustable chair with proper back support is your best ergonomic bet. Using office furniture as a model, a chair designed for a secretary instead of an executive will leave you more rested after hours in front of the monitor. And make certain your light source is adjustable to help eliminate glare off your CRT. The best setup is an area lamp in addition to diffused room light.

■ **SCREEN CLEANER.** This is the only cleaning product that means more to your comfort than the computer's. After a while, the static charge on any monitor's screen attracts dust, and looking through a layer of dust is not very restful. Cleaning your screen regularly is one of those little jobs that can mean a big difference in your computing. Also, if you're using a color monitor, you'll notice how much brighter the colors appear when the screen is clean.

■ **ANTI-GLARE SCREEN.** The glass screen of a CRT reflects light very well—and that's a problem. Some monitors have an anti-glare surface, but that may not provide enough protection in a bright environment. By making it easier to read what's on the monitor, anti-glare screens help prevent errors and physical discomfort. Colors often look brighter. Some anti-glare screens also offer protection from radiation emitted by your CRT, usually by impregnating the attachment with lead.

■ **MONITOR/PRINTER/CPU STANDS.** After you've used your computer for a while, you'll see whether you need some kind of stand. If you find yourself bending over your head when looking at your screen, consider a monitor stand. Most stands will turn 360 degrees and tilt up and down, allowing you to position your monitor so that you no longer have to twist and turn to read it clearly.

Does paper always tangle as it goes through your printer? Then you need a printer stand. There are all kinds, from desktop items that lift and tilt your printer to tables designed to hold the printer and channel reams of paper through without snags. If your printer has bottom feed, you'll find many stands with slots for this convenience. Most people can get good use from



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DISK 1 includes BANNERS AND THE PITS OF CHAOS. Banners is a unique program that prints text and graphics in up to seven sizes of fonts. There are two fonts that were designed for youthful tastes and you have the ability to design your own.

The PITS OF CHAOS is an adventure game that is a bonus program on Disk 1. The instructions are built into the game and when you beat it, the software automatically regenerates to play you again.

DISK 2 includes POWER DRAW AND PAINT BOX. The two programs establish a sophisticated program that rivals the best electronic paint and coloring programs on the market. The software allows you to combine text and graphics to generate all levels of basic design. The draw program helps you generate the design layout and the paint program fills in the free areas with a multitude of design elements with a simple stroke of a key. The software enables you to automatically repeat the pre-formed design which saves hours of duplicating the creative work.

POWER DRAW AND PAINT BOX can generate graphics for laying out letterheads and forms, charts, graphs, presentations, place mats, menus, architectural layouts, and simple to super graphics. The uses are unlimited and Disk 2 is exceptional for computer literacy classes and use by ages 8 to 80.

DISK 3 was designed to teach and entertain children age 4 through 10. The GALLERY, and KALEIDOSCOPE I and II are perfect for small children because they are so simple to use and provides an electronic coloring book of pre-made pictures and designs. Children enjoy watching the designs form and build, then can add their own creativity when they print them out to color.

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Manufacturers of Computer Accessories & Supplies

We've compiled a list of reputable companies in the computer accessory field. For further information, contact the manufacturer or one of the sources listed in the "How To Buy Computer Accessories" box.

Manufacturer	Types of Accessories	Products to Look For
ACCO International Inc. 770 S. ACCO Plaza Wheeling, IL 60090 (800) 323-7882 (800) 942-6999 (in IL only)	Surge protectors. Furniture. Disk boxes. Anti-static mat. Anti-glare screens. Lock. Printer stands.	Desktop printer stands (\$30-\$50). Three sizes of anti-static mats (\$13-\$70). Tables (\$130-\$170). Anti-glare filters (\$30-\$40). Surge protectors (\$30-\$80); w/EMI-RFI filters (\$45-\$100). Ergonomic chair (\$355).
Alberto Culver 2525 Armitage Ave. Melrose Park, IL 60160 (312) 450-3000	Anti-static spray.	Static Guard is available in 3-oz. (\$1.79) and 6-oz. (\$2.79) sizes. Also good for eliminating static electricity with clothing or other electronic equipment.
Amaray International Corp. 14935 N.E. 95th St. Redmond, WA 98052 (206) 881-1000	Disk boxes. Printer stand.	Media Mate disk boxes (\$15); with locks (\$20-\$28). Printer stand with slot for bottom feed (\$20). DiskBank disk box storage system (\$4-\$20). Media Pack library cases (\$17 for four).
Amherst International 540 N. Commercial St. Manchester, NH 03101 (800) 547-5600	Dust covers. Anti-static mats. Carrying cases.	Cover Craft anti-static vinyl dust cover line (\$6-\$20). Regatta cloth dust covers in navy or sand (\$22-\$35). Stat Pruf anti-static mats (\$15-\$60). Field Pro carrying cases (\$30-\$100).
Automation Facilities Corp. 6383 Rose Lane Carpinteria, CA 93013 (805) 684-5464	Drive cleaners. Screen cleaners.	The FloppiClene (\$35) disk drive head cleaning system contains 50 disposable cleaning disks. The MicroClene kit offers an anti-static screen cleaner and foam cleaners for the CPU (\$25).
Bowater Computer Forms 3000 East Plano Parkway Plano, TX 75074 (214) 578-2000 (800) 527-3412	Continuous form paper and business forms.	Offers total line of high-quality computer paper and forms. Get free Brown Disc Scholar diskettes plus free software programs with Show & Go 1000-pack of paper (\$8-\$10). Or get a free file with Paper & Files continuous form paper (\$30-\$40).
Bush Industries, Inc. One Mason Drive Jamestown, NY 14702 (800) 228-2874 (800) 248-2874 (in NY only)	Furniture.	Attractive oak furniture works as well in homes as in offices. Modular Oak 160 Series consists of desk (\$200), hutch (\$200), printer stand (\$160), and file-drawer pedestal (\$140).
CompuCover P.O. Box 310 #1 Andalusia Mary Esther, FL 32569 (904) 243-5793 (800) 874-6391	Dust covers. Disk wallet.	Complete line of dust covers for almost any computer, printer, disk drive, monitor, keyboard, or modem. Prices range from \$5 to \$25. Disk wallet for transporting disks (\$10-\$17). Also make custom covers for special needs.
Computer Accessories Corp. 6610 Nancy Ridge Drive San Diego, CA 92121 (619) 457-5500 (800) 582-2580	Surge protector. Monitor stand. UPS. Cables. Switch boxes.	PowerLine One single outlet surge protector (\$15). Other PowerLine surge protectors (\$50-\$80). T200 tilt/swivel monitor stand (\$35). Data Director switch boxes available in both Centronics parallel and serial interfaces (\$160).
Computer Coverup, Inc. 22305 Calumet Chicago, IL 60622 (312) 326-3000 (800) 282-2541	Printer stands. Dust covers. Carrying cases.	The Pedestal printer stands with tray (\$28-\$32). Navy blue cloth dust covers (\$8-\$30) for Apple, IBM, Compaq, and most printers. Anti-static vinyl dust covers in clear or putty-colored (\$4-\$18). Cordura nylon carrying cases in gray (\$60-\$100).
Computerise, Inc. 47-09 30th St. Long Island City, NY 11101 (718) 786-9100 (800) 346-0066	Printer stands. CPU stand. Keyboard drawers.	Mister printer stand (\$20). Heavy-duty metal printer stands (\$30-\$35). Vertical CPU stand (\$50). Black or putty-colored keyboard drawer (\$90).
Curtis Manufacturing Company 305 Union St. Peterborough, NH 03458 (603) 924-3823	Printer/monitor/computer stands. Anti-static mat. Surge protectors.	Diamond (\$50) and Emerald (\$60) surge protectors; Sapphire (\$80) and Ruby (\$90) with EMI-RFI filters; Universal printer stand (\$20) and CPU stand (\$30). Anti-static mat (\$40). Printer/modem cables (\$30).
Data Spec 20120 Plummer St. Chatsworth, CA 91313 (818) 993-1202 (800) 431-8124	Cables, connectors. Switch boxes. Surge protectors.	XP series switch boxes include Model DS2502 (\$60) for serial and IBM parallel and Model DS3602 (\$100) for parallel. Cables for connecting printers, modems, monitors for Apple, IBM, and Macintosh (\$11-\$17). Full line of connectors.
Deluxe Computer Forms 530 N. Wheeler St. St. Paul, MN 64046 (612) 631-8500 (800) 328-0304	Continuous form business forms and checks.	Major manufacturer of preprinted business forms and checks for almost every program that needs forms or checks (such as <i>Managing Your Money</i>). 20 lb. bond, 1,000 sheets (\$16). Sells through catalog or in stores.
Dennison Carter's Computer Supply Group 275 Wyman St. Waltham, MA 02254 (617) 890-2950 (800) 343-8413	Drive/screen/printer cleaners. Anti-static spray. Printer ribbons. Continuous form labels.	Elephant-brand drive (\$30), printer (\$35), screen (\$9) and computer (\$9) Cleaning Kits. Anti-static kit (\$9). Printer ribbons (\$2-\$12). PRES-a-phy continuous form labels (\$5-\$27).
Eastern Software Distributors, Inc. 3904 Hickory Ave. Baltimore, MD 21211 (301) 366-5100 (800) 638-7563	Continuous form paper. Business forms.	The RainbowPak line (\$70-\$80) offers micro-perf paper in bright gold, red, and blue; and pastel shades of ivory, pink, blue, canary, goldenrod, and green. Available in mixed or solid colors, in 120 or 300 sheets, or in 2,400-sheet cartons. Blank, 3-part, carbonless forms (\$7-\$80).
Electronic Protection Devices 35 Dunham Rd. Billerica, MA 01821 (617) 663-0017 (800) 343-1813	Surge protectors. UPS.	Lemon (\$45) and Lime (\$70) surge protectors. Peach (\$60) and Orange (\$100) surge protectors with EMI-RFI filters. These brightly colored products also come in plain white ("vanilla"). Grizzly UPS, 300-2000 watt (\$595-\$1,995).

THE UBIQUITOUS DISK

Of all the items that get added to your computer system, floppy disks are probably the most common. After all, you can't start your computer without one.

While the disk itself is indeed soft and floppy, it's encased in a vinyl jacket (5.25" disks) or a plastic shell with metal shutter (the newer 3.5" disks). Coated with metal oxide particles, disks are magnetic media; that's why you'll find many of the same companies making disks, audio cassettes, and video tapes—such manufacturers as Maxell, TDK, 3M (the "Scotch" people), Sony, BASF, and Memorex. Some companies, such as Dysan (Xidex Corp.), Brown Disc, and Verbatim, specialize in making floppy disks and often manufacture them for other brands as well.

When shopping for disks, be aware that most name-brand disks are so similar in quality that manufacturers have learned to compete in other ways. Disks in colors other than black are one attraction; Fuji and Sentinel make disks in a range of hues. Warranties are another competitive area. Some are for 20 years; others, like Maxell's warranty, last a lifetime. Polaroid offers you a "Data Rescue Service"; should any Polaroid disk be damaged for any reason (cigar ash, ketchup, etc.), send them the disk and they will recover the data at no cost.

Special promotions can add real value for the consumer. For example, when you buy Brown Disc's Scholar line, you get two coupons. One is for a free package of Bowater brand, 20 lb. bond, micro-perf computer paper. The other is for free software from *The Creative Construction Set* series, which includes banner-making, drawing, and graphics printing programs. BASF is running a sweepstakes with prizes that include cash or an Apple IIc.

All the companies listed below sell top-quality disks in all the major configurations. Contact them for more data.

3M (612) 733-1110 & (800) 328-1684. BASF (800) 343-4600; Brown Disc (303) 593-1015; Dysan (Xidex Corp.) (408) 988-3472; Elephant (617) 769-8150; Fuji (212) 757-9100; Kodak (800) 232-5111; Maxell (201) 641-8600; Memorex (408) 987-2350; Opus (216) 362-1550; Polaroid (800) 241-4403; Scholar/Brown Disc (303) 593-1015; Sentinel (617) 775-5220; Sony (201) 930-1000; Tandy (817) 390-2728; TDK (156) 625-0100; Verbatim (408) 245-4400.

Manufacturer	Types of Accessories	Products to Look For
Electronic Specialists, Inc. 171 S. Main St. Natick, MA 01760 (617) 655-1532	Surge protectors. Modem line protectors. UPS.	Commercial grade surge protectors, models ISO-1 and ISO-2 (\$90). Industrial grade, with EMI-RFI filters, model ISO-3 (\$136). PDS-II modem line protector (\$74). Sine UPS (\$1,095-\$1,495).
Inland 32046 Edward Madison Heights, MI 48071 (313) 583-7150 (800) 521-8428	Surge protector. Modem line protector. Printer/CPU stands. Dust covers. Disk boxes.	Disk boxes hold from 5 to 120 disks (\$2-\$24). Power Guard (\$50) surge protector with EMI-RFI filters. Safe Talk modem line protector (\$30). Universal monitor stand (\$30). 5 types of printer stands (\$20-\$70). Strongman CPU stand (\$50).
Innovative Concepts Inc. 1971 Concourse Drive San Jose, CA 95131 (408) 262-6680 (800) 538-7015	Screen/drive/keyboard/mouse cleaners. Disk boxes. Printer stands. Keyboard covers. Anti-static mats.	The Flip 'N' File disk box series has sizes for 5 to 100 disks (\$3-\$40). Stax printer stands (\$20-\$40). Drive/Screen Cleaning Kit (\$15-\$20). Compu-Cover series of keyboard covers for Apple, Atari, C 64, IBM PC (\$9-\$12).
Kalmar Designs Inc. P.O. Box 1400 3303 Merrick Road Wantagh, NY 11793 (516) 221-8400	Disk boxes. Printer/monitor stands.	Made of teak wood, disk boxes hold from 45 to 110 disks (\$24-\$55). Teak printer stands (\$38-\$50), monitor stands (\$38-\$65).
Kensington Microware Ltd. 251 Park Ave. South New York, NY 10010 (212) 475-5200 (800) 535-4242	Surge protectors. Fans. Printer stands. Anti-glare screen. Dust covers. Disk boxes. Drive/mouse cleaners.	System Saver surge protector and fan (\$90). Polarizing anti-glare screen (\$50). Dust covers for Macintosh and Apple (\$14). Complete line of other "Maccessories" for the Macintosh includes mouse and disk drive cleaning kits (\$25-\$30).
Memorex Media Products 1125 Memorex Drive Santa Clara, CA 95052 (800) 222-1150	Drive/screen/printer cleaners. Printer stand. Disk boxes. Printer ribbons. Continuous form paper.	Computer Cleaning System (\$20) for drive, screen, printer, and keyboard. Printer stand (\$25). Continuous form paper in standard and micro-perf, all-purpose and laid-finish (\$5-\$19).
MicroComputer Accessories, Inc. 5405 Jandy Place Los Angeles, CA 90066 (213) 301-9400	Disk boxes. Printer/CPU stands. Anti-glare screens. Dust covers. Keyboard drawers.	Rolltop disk boxes hold 120 disks (\$36; \$40 with lock). Vertical CPU stand for IBM PC/XT (\$50). MicroFold printer stands (\$45-\$50). Full line of dust covers (\$13-\$30). Anti-glare screen (\$25).
Networx 203 Harrison Place Brooklyn, NY 11237 (718) 821-7555 (800) 522-2222	Surge/modem protectors. Anti-glare screen. Drive/screen/printer cleaners. Switch boxes.	The Wire Tree (\$90) surge protector with EMI-RFI filters. Networx modem line protector (\$22). Anti-glare screens (\$30-\$40). Drive/screen cleaning kits (\$6-\$11). Dot Matrix Cleaning Kit (\$30). Switch boxes (\$90-\$140).
O'Sullivan Industries, Inc. 1900 Gulf St. Lamar, MO 64759 (417) 682-3322	Furniture. Monitor stands.	Modular wooden desks, hutches, and printer/monitor stands. Desks (\$65-\$240). Printer stands (\$60-\$170). Hutes hold monitor, books, etc. (\$100-\$120). Standup workcenters (\$100-\$240).
Panamax 150 Mitchell Blvd. San Rafael, CA 94903 (415) 499-3900 (800) 472-5555	Surge protectors. Modem line protectors. UPS.	Max 2 (\$79) and Max 6 (\$99) surge protectors with EMI-RFI filters. SuperMax (\$149) combines surge and modem line protectors in one package. PowerMax UPS (\$559-\$995).
PerfectData Corp. 9174 Deering Ave. Chatsworth, CA 91311 (818) 998-2400	Disk/screen/keyboard cleaners. Anti-static spray. Printer stand. Disk boxes. Anti-glare screen.	Case for Computer Care (\$50) contains drive/screen cleaners and anti-static spray. Kit for Computer Care (\$20) offers drive/screen/CPU cleaners, and anti-static spray. Printer stand (\$16). Dial 'N' File disk boxes (\$7-\$20).
Pfanstiehl 3300 Washington St. Waukegan, IL 60085 (312) 623-1360 (800) 323-9446	Surge protectors. Furniture. Anti-static pad. Disk boxes. Paper. Ribbons. Dust covers. Drive cleaners. Cables.	Wide range of cables for most computers (\$6-\$33). Surge protectors (\$12-\$109). Dust covers for Apple, C 64, Atari, IBM and Macintosh (\$6-\$16). Screen and keyboard cleaners (\$4 each).
RAM 8306 Wilshire Blvd., Suite 10 Beverly Hills, CA 90211 (213) 931-6065 (800) 227-2001	Anti-glare/anti-radiation screen filters. Chair.	CRT Shields offer both glare protection and are impregnated with lead to reduce monitor radiation; for monitors and televisions (\$30-\$48). Balans-type chair comes knock-down for only \$45.
Recoton 46-23 Crane St. Long Island City, NY 11101 (718) 392-6442 (800) 223-6009	Drive/screen/CPU cleaners. Surge protector. Anti-static spray. Dust covers.	Total Maintenance System drive cleaner (\$20). Screen/CPU cleaning package (\$10). Six-outlet surge protectors (\$30-\$70). "Work area" anti-static spray (\$10). Various dust covers (\$10-\$20).
Rediform Office Products 15 Monhegan St. Clifton, NJ 07013 (201) 472-5301 (800) 528-1369	Continuous form paper, index cards, mailing labels, and business forms.	Micro-perf paper, 25% rag, watermarked bond; 150 sheets (\$9); 3,000 sheets (\$147). Continuous index cards, 3" x 5" detached, 500 cards (\$9). Self-adhesive labels, 1,000 labels (\$10). Standard computer forms available for hundreds of programs.
Suncom, Inc. 260 Holbrook Drive Wheeling, IL 60090 (312) 459-8000	Disk cleaner. Printer/monitor stands. Dust covers. Desk light. Disk boxes. Copy stand. Disk notcher.	Monitor Station stand (\$20). Printer Organizer Station stands (\$6-\$15). Oakwood disk boxes (\$25-\$40). Dust covers (\$8-\$10). Drive cleaner (\$8). Datalight lamp (\$30) organizes work area.
Tandy Corporation 1800 One Tandy Center Ft. Worth, TX 76102 (817) 390-3700	Disk boxes. Anti-glare screen. Printer/monitor stands. Cables and connectors. Switch boxes. Furniture. Anti-static mat/spray. Surge protector. UPS. Paper.	Disk boxes (\$3-\$25). Anti-glare screen (\$17). Printer (\$20-\$150) and monitor stands (\$17). Desks (\$50-\$300). Surge protector (\$50-\$70). Security lock (\$25). Switch boxes (\$120-\$250). UPS (\$695). Anti-static mat (\$90) & spray (\$6).
TrippLite, a division of Tripp Manufacturing Co. 500 N. Orleans Chicago, IL 60610 (312) 329-1777	Surge protectors. Modem line protector. UPS.	Isobar line of surge protectors with EMI-RFI filters and 2, 4, or 8 outlets (\$60, \$80, \$110). BC Models UPS series (\$359-\$1,179). TSB Model modem line protector (\$60).
Z Business Products, Inc. 113 W. 14th Ave. North Kansas City, MO 64116 (816) 474-4455 (800) 821-2473	Continuous form mailing labels. Diskette labels.	Mini Pak self-adhesive, continuous form mailing labels (\$7 per Pak). Preprinted shipping labels, 335 count in red or blue (\$10). Names badges in red, blue, or green, 250 count (\$10). Larger quantities available at lower unit costs.

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a printer stand. CPU stands exist mainly for IBM PC's and compatibles; they enable you to save desk space by standing the big box (that contains the central processing unit or CPU) vertically on the floor.

■ PRINTER ENCLOSURE. Is the noise from your printer making it impossible to get other work done? Then an acoustic printer enclosure is your best solution. Most enclosures are foam-lined with plexiglass covers and come with a fan for cooling the printer.

■ COPY HOLDER. If you often type in manuscripts or programs, a copy holder will make it easier to position the copy in the most readable manner. Over time, your neck will appreciate the comfort.

Supplies

The "big three" of computer supplies are disks, paper, and printer ribbons.

■ DISKS. When shopping for disks, you'll want to be aware of these specifications or choices: single or double sided? Single, double or quad (also called high) density? With 5.25" disks, you need to be aware of soft vs. hard sector (soft is the most common). With 3.5" disks, note that you'll find single or double track; double track and 135 tracks per inch (TPI) designs are the most common. You'll need disks with specs that are suitable for the following computers:

Single sided, single or double density, soft sector, and 5.25" specs: Apple, Atari 800/XL/XE series, C 64/128, Tandy Color Computer.

Double sided, double density, soft sector, and 5.25" specs: IBM PC/PCjr, and compatibles.

Single sided, double density, double tracked, 3.5" specs: Atari 520ST (w/320K drive) and Macintosh (w/400K drive).

Double sided, double density, double tracked, 3.5" specs: Amiga, Atari 1040ST, Apple II (w/Unidisk drive), IBM PC/XT and compatibles, and Macintosh Plus (or any Mac w/800K drives).

(See the box "The Ubiquitous Disk" for more information on floppies.)

■ PAPER. Let a friend of mine talk: "When I first got my printer, I didn't buy any special computer paper. I had a lot of single sheet paper; why not use that up, I thought. Do I have to tell you what a pain it was to insert

sheet after sheet when doing printouts? So when I got paper with removable sprocket holes, it became a lot easier to use my printer."

"After I discovered the joys of continuous form paper, I found out about "micro-perf" paper. Once the holes are removed, it's hard to tell it was never single-sheet paper. And now I know that paper with a high-quality watermarked bond or a laid finish is also available in continuous form. This means that even my essential correspondence can be printed out without the annoyance of single sheets. Just lately, I've been seeing ads for computer paper in all the colors of the rainbow—reds, blues, greens, and golds. Now all the printouts from my graphics programs, like *The Print Shop* (Broderbund), can look extra sharp."

■ RIBBONS. Not only do you need the specific type of ribbon that works with your printer, but you want to consider quality as well. Cheap ribbons could smear, and who wants that? The better ribbons for dot-matrix printers have a lubricant that extends the life of your print head. Most ribbons are made of nylon, and you can use solid colors other than black, such as red, blue, or brown, even without a color printer.

■ INDEX CARDS AND MAILING LABELS. Index cards, mailing labels, and "rolodex" cards are all available in continuous form for your printer. Once you've tried these features, rather than single cards or labels, you won't believe how much easier it is to print and how much time you save. Index cards and mailing labels come in various sizes and colors and in quantity packs to suit every need.

■ CHECKS AND BUSINESS FORMS. Whether you're running a small business with your computer or using a home finance package to straighten out your accounts, preprinted checks on continuous form can help make your electronic accounting more of a reality. Imagine doing a whole month's worth of checks for bills in minutes. Catalogs are a good source for these items.

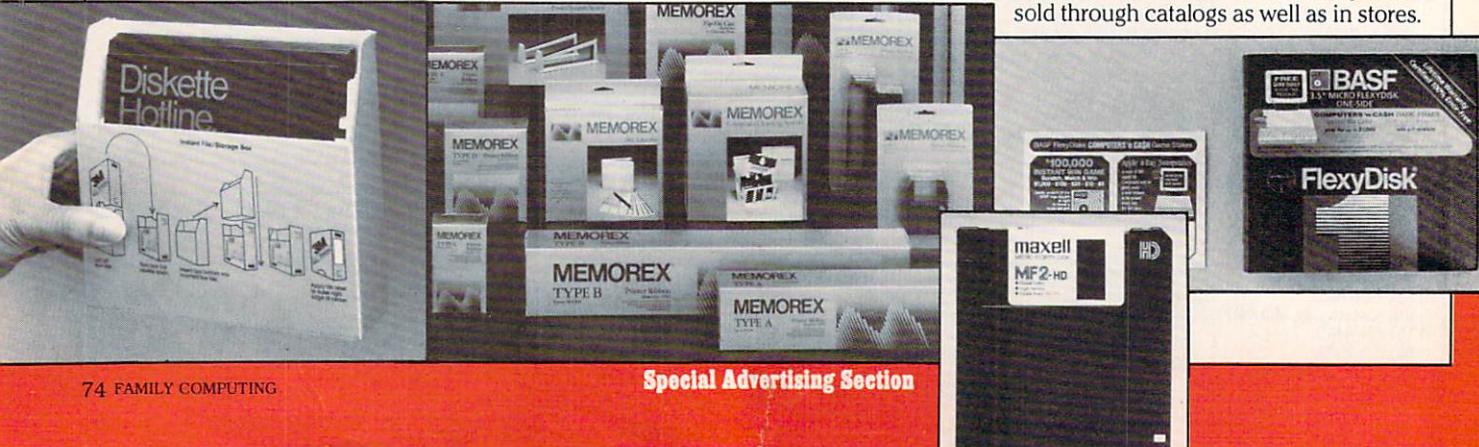
While you won't need every accessory listed above, if you pick and choose wisely, you can help make your computer system last longer, and your computing experiences will be more enjoyable and comfortable.

How to Buy Computer Accessories: The Sources

1. The Retail Scene—Computer, Office Supply, Stationery, and Discount Stores. While computer stores, such as Radio Shack, are certainly one good source for accessories and supplies, they're not the only ones. Whether you're buying for home or office use, you'll want to try an office supply or stationery store, most of which carry a wide range of computer-related items—especially paper, disks, disk boxes, and furniture. (Depending on your taste in home furnishings, an office furniture store could be your source for ergonomically correct tables and chairs.) And don't forget discount stores; you get less service but often better prices.

2. Mail-Order Ads. Even though most mail-order ads in computer magazines are for hardware and software, many of the same companies sell accessories, too. A telephone call will tell you. Then there are ads for companies that specialize in supplies such as disks or ribbons. You'll probably find such ads in the back of FAMILY COMPUTING. You can test the reliability of any mail-order company by making a small purchase the first time. That way, if you're dissatisfied, you can check out another company for further purchases.

3. Mail Order Catalogs. Catalogs are an easy way to shop, especially if you don't need an item right away. They're also a good general source for accessory information. For example, one catalog sells this typical range of items: disks, disk boxes, continuous form paper and labels (all qualities), dust covers, anti-glare screens and sprays, copy holders, drive head cleaners, pre-printed business forms, checks, ribbons, furniture, printer and monitor stands, computer locks, surge protectors, and acoustical printer enclosures. Many of the manufacturers listed have their products sold through catalogs as well as in stores.



This Month!!

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Edited by Bernadette Grey

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POWER

FOR THE COMPUTER GENERATION

Computers in Movies

How a Behind-the-Scenes Programmer Helps Make Movies That Jump off the Screen

Buddy sat on the edge of his seat in the darkened movie theater, watching the dramatic final battle of *Return of the Jedi* for the 47th time. Dressed in his regulation X-wing pilot's outfit, he was pretending that he was leading the attack on the Death Star. Suddenly a TIE fighter came in close, and Buddy dove for cover, throwing his gallon tub of buttered popcorn high into the air. Remembering that it was just a movie, he climbed back into his seat. Meanwhile, his popcorn had landed on top of three football players from his high school who were seated a few rows behind him, and they had begun hunting down their assailant. Buddy realized what had happened and made a strategic retreat out the emergency exit, leaving the destruction of the Death Star up to Lando Calrissian. And for the 47th time, Buddy wondered: "How do all of those special effects seem so real?"

Fortunately for Buddy, the Special Ks asked the right person that same question. And they got some answers. They interviewed Kris Brown, a computer engineer at Lucasfilm who did extensive work for *Return of the Jedi*, *The Empire Strikes Back*, and many other movies.

Special Ks: As most of us know, creating space ships and all of the other special effects used in some of our favorite movies is difficult. Why?

Brown: Making something like a space ship look and move realistically is extremely complicated. Often when you use special effects in a movie, you have to take many shots of the same scene, which then have



Computers helped make *Return of the Jedi*

to be overlaid, right on top of each other. When you have to lay 175 images on top of each other, as was done in *Return of the Jedi*, even an extra millimeter will cause problems.

Special Ks: Then how can you be precise?

Brown: We use what is called a motion controller. A motion controller can precisely duplicate the timing and motion of the images being filmed. It's a camera attached to a series of small motors and movable joints and is mounted on a track so it can be moved about. Each image's movement is tracked and filmed several times to achieve the special effects, and then the frames are superimposed on one another. The slightest timing or spacing error can cause major problems.

Special Ks: What part do computers and software play in movie making?

Brown: The hardware and software that I design are used to control every move and action the motion controller makes. In addition, computer graphics is starting to be incorporated into movie making. Computer graphics can be used to simulate images such as space ships.

Special Ks: How have computers improved the motion-control process?

Brown: Computers are far more efficient and less expensive than manual methods, which is how *Star Wars* was done. With computers, it's a snap to make quick changes. You can do things with computers that just couldn't be done before.

Special Ks: What's your educational background?

Brown: I have a Bachelor of Science in Engineering from Princeton University and a Master of Business Administration from the University of California at Los Angeles (UCLA).

Special Ks: How did you get involved with the *Star Wars* saga?

Brown: It was accidental. At the time, I was working on *Buck Rogers* and *Battlestar Galactica*. Computers were just being introduced into the special-effects field for movie making and they needed people to write software for some of the special effects in *Battlestar Galactica*. Afterward, when they were looking for people to write software for *The Empire Strikes Back*, I joined up because *Star Wars* had blown me away.

Special Ks: What can we expect from Lucasfilm in the future? What about a fourth *Star Wars*?

Brown: We are currently working on the fourth *Star Trek*, along with a third *Indiana Jones*. At the moment, the fourth *Star Wars* is up in the air—THE SPECIAL Ks.

STRATEGY

TIPS, TRICKS, AND HINTS

SERPENT'S STAR

Broderbund. Graphic adventure. Your mission: As MacSteele, a famous archaeologist, you must find



You securely tether your horse to a post outside the inn.

◆ Your horse is not trustworthy (especially when left alone, or when ridden across bridges).

three scrolls that will lead you to the Serpent's Star gem—which is said to give immortality (or at least \$25 million). Once you find the scrolls, you

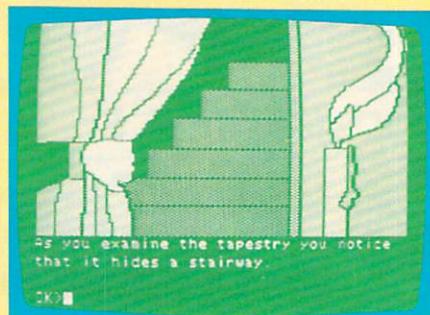
must seek out the lost city of Kara-Koram, where the real adventure will begin (hints and game for Apple, Commodore, Atari).



You now face the wandering monk.

OK/GIVE TSAMPA

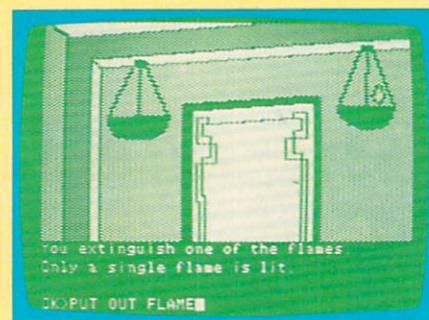
◆ When you come across the wandering monk, give him tsampa, and ask about the scrolls.



As you examine the tapestry you notice that it hides a stairway.

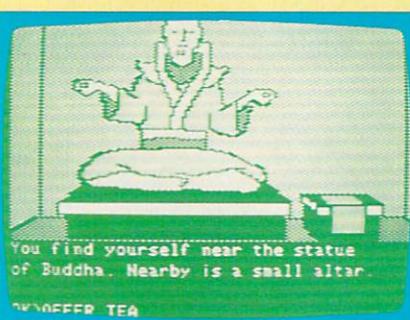
OK?

◆ Tapestries are very concealing.



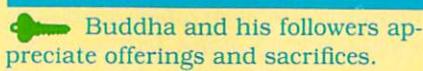
You extinguish one of the flames. Only a single flame is lit.

CLOSE OUT FLAME

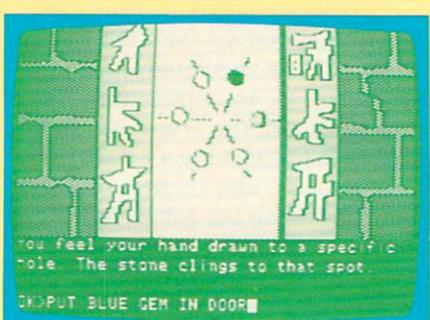


You find yourself near the statue of Buddha. Nearby is a small altar.

OFFER TEA

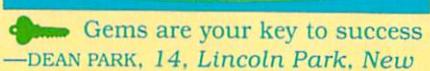


◆ Buddha and his followers appreciate offerings and sacrifices.



You feel your hand drawn to a specific hole. The stone clings to that spot.

CLOSE BLUE GEM IN DOOR



◆ Gems are your key to success
—DEAN PARK, 14, Lincoln Park, New Jersey; BRIAN EVAN LAU, 13, Cupertino, California

SPELLBREAKER

Infocom. Text adventure. Your mission: Magic is failing across the land, and you must restore it to its original power (hints and game for all computers).

◆ Label each cube with the magic burin (a cutting tool).

◆ Enter the zipper and get the scroll.

◆ While in Packed Earth, learn BLORPLE a few times, and then GO DOWN. If you've fallen more than four turns, BLORPLE the cube and try again.

◆ Go to the highest point on the cliff. When you get the message that you are about to die, GIRGOL the rocks, then GO UP.

◆ CASKILY the hut.

◆ GO SOUTH from the water room. Drop the bread, and get the cube before you get the bottle. Remember to put all your possessions in the zipper before you go south, and make sure you've learned BLORPLE.

◆ ANIMATE the idol, wait one turn, and then ESPNIS it.
—JOHN CAIN, 15, Poulsbo, Washington

Software Scoop!!!

Infocom author Brian Moriarty has created a new piece of interactive fiction called *Trinity*, after the world's first atomic explosion with the same name. The adventure/fantasy "puts destiny in your hands, and lets you decide what happens," says Moriarty. Although partly based on real events, *Trinity* is more an entertain-

ing fantasy than a history lesson. The game is \$40 for 128K Apple IIe, IIc, Macintosh 512, Macintosh Plus, IBM PC and compatibles, Amiga, Commodore 128, and Atari 520 ST. It comes with "The Illustrated Story of the Atom Bomb" and other doo-dads . . . Lovers of *Beach-Head* take note: Here comes *Beach-Head II—The Dictator Strikes Back*. Yup, Access Software Inc. has done it again. The sequel picks up where *Beach-Head* left off,

and was designed by Access's dynamic duo: **Roger and Bruce Carver**. Available for 64K, Atari 800/XL/XE, Commodore 64/128, and 64K Apple II series computers for \$35-\$40 . . . If you liked Strategic Simulations' *Colonial Conquest* (and who didn't?), then you'll be happy to know that designer Dan Cermak is at it again. He's currently working on a new game—a World War II simulation . . . Tune in next month for more info!

Q and A

In Zork I (Infocom), how do I get rid of the bat so I can get the jade figurine?—JUSTIN WAINWRIGHT, 11, Mt. Clemens, Michigan

Drop or hold the garlic in the bat room.

In Zork II (Infocom), how do I get the wizard's wand?—ANDY PETERSON, 16, DeWitt, Iowa

You must summon the demon and give him the 10 treasures. Then he will grant you a wish. Ask the demon to get the wizard's wand.

In Zork II, how do I get through the oddly angled room?—JUSTIN WAINWRIGHT, 11, Mt. Clemens, Michigan

The oddly angled room is a baseball diamond. Take the bat in the SE (home plate), run the bases (SE, NE, NW, SW), and then go north.

In Zork II, how do I get by the lizard in the guarded room?—GREG MYERS, 12, Kailua, Hawaii
Feed it candy.

In King's Quest II (Sierra On-Line), how do I get past the ghosts at the castle?—ROBBY HARRYMAN, 14, Bethesda, Maryland

You must take the cross you got from the monastery and wear it.

In King's Quest II, how do I get the maiden out of the tower?—JENNIFER CASSAGNE, 13, Reserve, Louisiana

You must hold the amulet and think "home."

In The Bard's Tale (Electronic Arts), where is the Review Board?—VICTOR LIMARY, 12, Albuquerque, New Mexico

It is on the east side of the northern section of Trumpet Street (just above the Inn).

In Ultima III (Origin Systems), where do I find the exotic weapons?—LARRY KEEVILLE, 14, Clifton Heights, Pennsylvania

Try DIGGING on the two-square island near the town of Fawn.

In Planetfall (Infocom), how do you kill the microbe?—KALEB YOHAY, 17, New York, New York

With the dial set at anything except 1, shoot the microbe with the laser until the laser is warm. When the microbe has become interested in the heat, throw the laser off the strip.

In Hitchhiker's Guide to the Galaxy (Infocom), where do you plug in the spare improbability drive?—LARRY MYERS, 42, Kailua, Hawaii

The improbability drive can be plugged into the holes on the control panel on the bridge.

H I N T

ULTIMA IV, Origin Systems (Apple, Atari, C 64). Role-playing adventure. Your mission: Gain enlightenment in eight virtues to become an avatar.

When on land in Britannia, insert the underworld disk and wait for the drive to access, which will put walls and dungeon rooms on the screen. Search until you find a chest, and then GET it as many times as you wish. These chests don't disappear after you get them. To restore the normal map, re-insert the Britannia disk, move away from the "dungeon" until the drive accesses, and then move back again.—CHRIS TACKE, 15, Missoula, Montana

Wizardry, Sir-Tech Software (Apple, IBM). Role-playing adventure. Your mission: Fight your way through a ten-level maze filled with evil monsters and deadly traps, gaining experience and power as you venture deeper, and kill the evil wizard Werdna.

Here's how to get infinite levels for any character: First, get him/her enough experience points to gain one level. Then, go to the Adventure's Inn, put a blank formatted disk in the drive, and press "A" (stables). After the first time, you'll gain a level each time you press "A."

Note: Be sure to put the scenario disk back in the drive immediately after you leave the inn; if you don't, the computer will crash the next time it tries to read the disk. —TIM SALAMY, 15, Alexandria, Virginia.

THE PSI-5 TRADING CO., Accolade (C 64). Strategy/Adventure. Your mission: Choose crew members (from a pool of applicants) for your merchant ship, and then set out across space to deliver your cargo.

In the beginning level, any unidentified ship will turn out to be an enemy (especially if a scout is one of the ships near you), so it can be to your benefit to open fire on all unknown ships. This will give you a chance to destroy them before they can shoot you. As a result, you'll have a much higher survival rate. Even if you do accidentally destroy an ally, the money you save from your cargo not spoiling will make up for it.

Try to choose crew members who are self-motivated (especially important in gunners and scanners). Also try to get members who won't crack under fire (because you're going to be under a lot of fire).—SPECIAL-K DAVID LANGENDOEN, 17, Brooklyn, New York

A MIND FOREVER VOYAGING, Infocom (All). Text adventure. Your mission: Navigate simulations of the future in order to prevent a disastrous plan.

When you enter Part III, go to Perelman's office and wait for Ryder and Perelman. RECORD their conversation.

To stop the saboteurs from destroying your CPU, turn off ventilation to delta sector.—MAX LAWRENCE, 13, Tallahassee, Florida

We need a few good hints! Help K-POWER readers be all that they can be by sending us hints for your favorite games. We have all the *Zork* and *Ultima III* hints we can handle, but we'll gladly publish and pay \$10 for hints we've not heard of. Send them to Hint Hotline, c/o K-POWER, 730 Broadway, New York, NY 10003. Hints will not be considered for publication unless accompanied by full name (no aliases, please), address, telephone number, and date of birth. Stumped gamers can send in their questions to the same address. We'll try to answer them in upcoming issues. (Note: The computer systems listed in parentheses indicate the computer versions the hints work for.)



MUSIC PROGRAMS

BY JOEY LATIMER

SOLAR RAY GUN

Years ago, I dreamt that I created a homemade solar ray gun. When I brought it outside, pointed it at the ground, and pressed the trigger, a huge hole appeared in our backyard. Luckily, when my father saw the hole, he finally agreed to get a built-in swimming pool. Too bad it was just a dream.



That dream has given me the inspiration to write this little program, which I've called *Solar Ray Gun*. I can just load it, type RUN, and fill the room with the same quasi-wild sound that the solar ray gun made in my dream. I guess I'm still hoping for that swimming pool.

ADAM/SOLAR RAY GUN

```

10 LOMEM: 29000:POKE 16953,0
20 FOR x = 28000 TO 28005:READ d
30 POKE x,d:NEXT x
40 TEXT
50 HTAB 6:VTAB 10:PRINT "Press any key to fire"
60 HTAB 8:VTAB 11:PRINT "the Solar Ray Gun."
70 GET a$:IF a$ = "" THEN 70
80 IF a$ = CHR$(3) THEN POKE 16953,95:END
90 HOME:HTAB 14:VTAB 10:PRINT "DUCK!"
100 POKE 28006,144:CALL 28000
110 FOR i = 0 TO 10:GOSUB 1000:NEXT i
120 FOR i = 0 TO 63:GOSUB 1000:NEXT i
130 POKE 28006,159:CALL 28000
140 GOTO 40
1000 POKE 28006,128:CALL 28000
1010 POKE 28006,i:CALL 28000
1020 RETURN
2000 DATA 58,102,109,211,255,201

```

ATARI 400/800, 600/800XL, & 130XE/SOLAR RAY GUN

```

10 OPEN #1,4,0,"K:"
20 GRAPHICS 0:POKE 752,1:PRINT CHR$(125)
30 POSITION 10,10:PRINT "PRESS A KEY TO FIRE"
40 POSITION 11,11:PRINT "THE SOLAR RAY GUN."
50 GET #1,K
60 GRAPHICS 18:POSITION 7,5:PRINT #6;"DUCK!"
70 IF K>127 THEN K=K-128

```

```

80 FOR I=1 TO 4
90 FOR J=K TO K+72 STEP 12
100 SOUND 1,J,10,15:POKE 53279,0
110 POKE 712,J:NEXT J:NEXT I
120 FOR I=15 TO 0 STEP -1
130 SOUND 1,70-I,10,I
140 NEXT I:GOTO 20

```

COMMODORE 64 & 128 (C 64 MODE)/SOLAR RAY GUN

```

10 S=54272
20 FOR I=0 TO 23:POKE S+I,0:NEXT I:POKE S+24,15
30 POKE S+5,1:POKE S+6,255:POKE S+12,1:POKE S+13,255
40 POKE 53280,0:POKE 53281,0
50 PRINT CHR$(147):POKE 214,10:PRINT
60 PRINT CHR$(156);TAB(9);"PRESS ANY KEY TO FIRE"
70 PRINT TAB(11);"THE SOLAR RAY GUN."
80 GET K$:IF K$="" THEN 80
90 K=ASC(K$):PRINT CHR$(147)
100 POKE 214,10:PRINT:PRINT TAB(17);CHR$(158);"DUCK!"
110 FOR I=K+200 TO K STEP -20
120 Y=I*40:FH=Y/256:FL=Y AND 255
130 POKE S+1,FH:POKE S,FL:POKE S+8,FH:POKE S+7,FL
140 POKE S+4,129:POKE S+11,33
150 NEXT I:POKE S+4,0:POKE S+11,0:GOTO 50

```

MACINTOSH W/MICROSOFT BASIC 2.0 OR 2.1/SOLAR RAY GUN

```

DIM RECTX(3)
RECTX(0)=97:RECTX(1)=174:RECTX(2)=147:RECTX(3)=365
TEXTFONT 0
WINDOW 1,"Solar Ray Gun",0,38)-(530,338)
START:
CLS:TEXTSIZE 24
LOCATE 3,8:PRINT "Press any key to fire"
LOCATE 4,9:PRINT "the Solar Ray Gun."
LOOP:
K$=INKEY$:IF K$="" THEN LOOP
CLS:TEXTSIZE 64:LOCATE 2,5:PRINT "DUCK!"
FOR I=1 TO 8
FOR J=8000 TO 1000 STEP -1000
SOUND J,.45
INVERTRECT VARPTR(RECTX(0))
NEXT J
NEXT I
FOR I=1000 TO 5200 STEP 600
SOUND I,.45
NEXT I
GOTO START

```

TANDY COLOR COMPUTER/SOLAR RAY GUN

```

10 CLS(5)
20 PRINT@197,"PRESS ANY KEY TO FIRE";
30 PRINT@231,"THE SOLAR RAY GUN.";
40 K$=INKEY$:IF K$="" THEN 40
50 FOR I=1 TO 4
60 CLS(I):PRINT@237,"DUCK!";
70 FOR J=200 TO 110 STEP -30
80 SOUND J,1:NEXT J,I:GOTO 10

```

TI-99/4A/SOLAR RAY GUN

```

10 CALL CLEAR
20 PRINT TAB(4);"Press any key to fire"
30 PRINT TAB(6);"the Solar Ray Gun."
40 CALL KEY(3,K,S)
50 IF S=0 THEN 40
60 CALL CLEAR
70 PRINT TAB(12);"DUCK!";
80 FOR I=800 TO 485 STEP -35
90 CALL SOUND(-50,I,0,-6,0)
100 NEXT I
110 GOTO 10

```

COMPUCOPIA

SHORT PROGRAMS BY JOHN JAINSCHIGG

A flaw has developed somewhere in the energy grid, and it must be found. You can't enter the grid directly, but you can conduct a *Radar Search*. Move around the grid's perimeter using the left and right arrow keys, and determine your distance from the flaw by pressing the "D" key. When you think you've deduced the flaw's coordinates, press the "G" key to enter them. There's just one catch: Each time you take a reading, the flaw grows larger. If the flaw gets too big, the Earth's energy supply will be cut off.

APPLE II SERIES/RADAR SEARCH

```

10 HOME:POKE -16368,0
20 PRINT "PRESS ANY KEY TO START.";
30 IF PEEK(-16384) < 128 THEN C = RND(1):GOTO 30
40 POKE -16368,0
50 XS = INT(RND(1)*38)+2:YS = INT(RND(1)*18)+2
60 DR = INT(RND(1)*3)+4:XC = 1:YC = 1:R = 0
70 HOME:FOR I = 2 TO 19:FOR J = 2 TO 39
80 HTAB J:VTAB I:PRINT CHR$(127):NEXT J:NEXT I
90 PRINT:PRINT TAB(9);"YOU ARE AT POSITION";
100 VTAB 21:HTAB 29:PRINT XC;" ";YC;" ";
110 HTAB XC:VTAB YC:PRINT "*";
120 IF PEEK(-16384) < 128 THEN 120
130 K = PEEK(-16384)-128:POKE -16368,0
140 K$ = CHR$(K+32*(K > 90))
150 IF K$ = "D" THEN 230
160 IF K$ = "G" THEN 280
170 IF K < 8 AND K > 21 THEN 120
180 VTAB YC:HTAB XC:PRINT " ";:D = ((K = 21)-(K = 8))
190 XF = ((YC = 20)-(YC = 1)):YF = ((XC = 40)-(XC = 1))
:IF XF*YF = 0 THEN 220
200 XC = XC-(YF = XF AND D = 1)+(YF > XF AND D = -1)
*:YF
210 YC = YC+((YF > XF AND D = 1)-(YF = XF AND D = -1))
*:YF:GOTO 100
220 XC = XC-XF*D:YC = YC+YF*D:GOTO 100
230 IF R = DR THEN PRINT CHR$(7);:HOME:HTAB 16:VTAB 12
:PRINT "YOU LOSE ...":END
240 R = R+1:HTAB 11:VTAB 22:PRINT "DISTANCE:";
250 PRINT SQR((XS-XC)^2+(YS-YC)^2)

```

```

260 FOR DE = 1 TO 500:NEXT DE
270 HTAB 11:VTAB 22:PRINT SPCC(28);:GOTO 120
280 IF R = 0 THEN PRINT CHR$(7);:GOTO 120
290 HOME:INPUT "ENTER COORDINATES: ";XI,YI
300 IF XI <> XS OR YI <> YS THEN PRINT CHR$(7);:GOTO 7
0
310 HOME:PRINT CHR$(7);
320 PRINT " YOU SAVED THE EARTH! HAVE A NICE DAY!"

```

IBM PC & COMPATIBLES/RADAR SEARCH

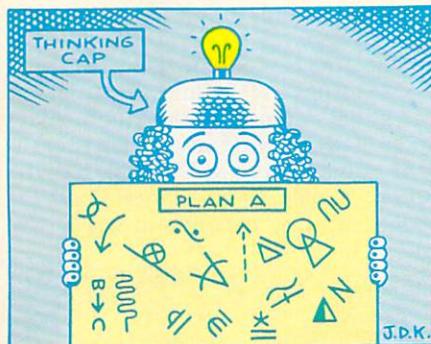
This program has been tested and found to work on the following computers and hardware configurations, using the BASICs shown: IBM PC w/Color/Graphics Monitor Adapter, w/Disk BASIC D2.00 or Advanced BASIC A2.00, IBM PCjr w/Cartridge BASIC J1.00, Tandy 1000 w/GW-BASIC 2.02 version 01.01.00.

```

10 WIDTH 40:KEY OFF:SCREEN 0:RANDOMIZE
20 XS=INT(RND*38)+2:YS=INT(RND(1)*18)+2
30 DR=INT(RND*3)+4:XC=1:YC=1:R=0
40 CLS:FOR I=2 TO 19:LOCATE I,2,0
50 PRINT STRING$(38,254):NEXT I
60 PRINT:PRINT TAB(7);"You are at position"
70 LOCATE 21,27:PRINT XC;",";YC
80 LOCATE YC,XC:PRINT "*";
90 K$=INKEY$:IF K$="" THEN 90 ELSE K$=RIGHT$(K$,1)
100 K=ASC(K$):K$=CHR$(K+32*(K>77))
110 IF K$="D" THEN 200 ELSE IF K$="G" THEN 250
120 IF K<>75 AND K>77 THEN 90
130 LOCATE YC,XC:PRINT " ";:D=((K=75)-(K=77))
140 XF=((YC=1)-(YC=20)):YF=((XC=1)-(XC=40))
150 IF XF*YF=0 THEN 190
160 XC=XC+((YF=XF AND D=1)+(YF>XF AND D=-1))*YF
170 YC=YC-((YF>XF AND D=1)-(YF=XF AND D=-1))*YF
180 GOTO 70
190 XC=XC-XF*D:YC=YC+YF*D:GOTO 70
200 IF R=DR THEN BEEP:CLS:LOCATE 12,16:PRINT "You Lose
...":END
210 R=R+1:LOCATE 22,12:PRINT "Distance:";
220 PRINT SQR((XS-XC)^2+(YS-YC)^2)
230 FOR DE=1 TO 500:NEXT DE
240 LOCATE 22,12:PRINT STRING$(22,32);:GOTO 90
250 IF R=0 THEN BEEP:GOTO 90
260 CLS:INPUT "Enter coordinates":XI,YI
270 IF XI<>XS OR YI<>YS THEN BEEP:GOTO 40
280 CLS:BEEP
290 PRINT " You saved the earth! Have a nice day!"

```

DESIGN A COMPUTER CONTEST



readers. Before we knew it, hundreds of clever contest ideas had piled up on our desks. One of the winners, **David Meyers**, 12, of Wyckoff, New Jersey, thought it would be fun to hold a "Design a Computer Contest" in which readers would create the computers of their dreams. That's what this month's contest is all about. Use your pencils, magic markers, computer, or

whatever to design that perfect computer! Then describe its features. You could win \$25 and possibly even see your creation in a future issue of K-POWER. Go ahead. Draw and describe the computer of your dreams, attach it to this entry form, and send it to "Design a Computer Contest," c/o K-POWER, 730 Broadway, New York, NY 10003 before August 22.

Last winter, as we huddled around a warm computer in our drafty New York City office, we realized that our data base of contest ideas was freezing up. So we turned to all of you for help. We held a "Contest Idea Contest," and offered \$25 for the three best contest ideas from our

Name _____	Sex _____	
Address _____		
City _____	State _____	Zip _____
Telephone (_____) _____	Birthdate _____	
Computer(s) I own: _____		

NEW HARDWARE

COMPUTERS

IBM PC Convertible

MANUFACTURER: IBM, Entry Systems Division.

ADDRESS: P.O. Box 1328, Boca Raton, FL 33432; (305) 982-3474

PRICE: \$1,995

taining Application Selector and SystemApps, utilities that help you avoid using PC-DOS commands.

Unlike many other laptop or portable computers on the market, the PC Convertible does not have a built-in modem, or a serial or parallel port. However, the PC Convertible Internal Modem (\$450) can be installed, and



Once code-named "Clamshell" by the trade press, the IBM PC Convertible is an easy-to-carry and attractive portable computer that is notable for several reasons. First, it has two 3.5-inch disk drives that store 720K each (about 350 typewritten pages). It's the first time any IBM computer has used that increasingly popular disk drive format, and may precipitate an industry movement in the 3.5-inch direction.

Second, the 80 x 25 liquid crystal display (LCD) can be detached, so that the computer can be connected to a conventional color or monochrome monitor. This feature, IBM says, makes the computer valuable for sales people, engineers, students and others who need "full-function" computing both at and away from their desk. The Convertible CRT Display Adapter (\$325) is needed to connect a monitor.

The 13-pound Convertible is battery-operated, and can go for six to 10 hours without recharging the battery pack. (The AC adapter can recharge the system while you are using it.) The 256K memory can be expanded to 512K by the user, with 128K memory expansion cards. The computer comes with a diskette con-

the PC Convertible Serial/Parallel Adapter (\$195) can be added to the unit.

The PC Convertible, as you might expect, is capable of running all IBM PC software. IBM plans to release its *Personal Decision* series in 3.5-inch format. Ashton-Tate, Lifetree Software, Living Videotext, Lotus, Micro-Pro, Microsoft, Microstuf, Satellite Software, Scarborough Systems, Tronix and other software companies have said they will convert some existing software to the new format.

For those users who wish to convert their own favorites, IBM also introduced an external 3.5-inch disk drive that can be used to transfer software from 5.25-inch disks to 3.5-inch disks.

MARKET UPDATE

The Okimate 20 (\$169), a thermal transfer color printer that works with the IBM PC and PCjr, Apple IIe and IIc, and Amiga, now is sold with a Plug 'n Print kit for the Atari ST (\$99) and C 64/128 (\$99). Atari users can print out 125 colors on the Okimate 20.

PRINTERS

Diconix 150 Portable Printer

MANUFACTURER: Diconix Inc., AD-

DRESS: 3100 Research Blvd., P.O. Box 3100, Dayton, OH 45420; (513) 259-3100

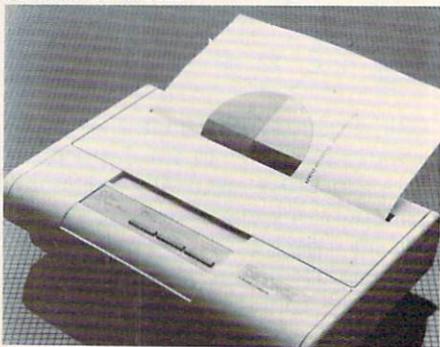
PRICE: \$479

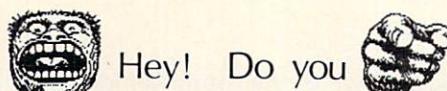
Portable computers that fit in briefcases and ride on trains and planes—or sit at home with their owners watching baseball games—have made a big difference in the lives of a lot of people. But one drawback has always been the difficulty of printing. Sure, you can connect these portables to your regular printer, but you're not going to carry that on the plane with you! Some desperate users have been known to walk into computer stores in distant cities and ask if they can "borrow a printer for a minute."

The Diconix 150 printer may solve such embarrassments. The battery-powered printer weighs about four pounds, and is roughly the size of a standard dictionary (2" x 6.5" x 10.8"). Since it uses an ink-jet printing method, which sprays ink onto paper rather than striking it with keys, the printer is quiet. Each inkjet cartridge (\$9.95) is good for about 500 pages.

The Diconix 150 prints on single sheets or continuous-feed computer paper (special ink-jet paper gives best results), and can print as fast as 150 characters per second, in a variety of styles. The Diconix printer uses a standard Centronics parallel connector and emulates the IBM Proprinter or Epson FX printer. Thus it is compatible with all popular software.

"The 150 is ideal for use with the IBM PC Convertible, and it's quiet and small enough for desktop use at home," says Loyd Tarver, vice president of marketing at Diconix, a division of Kodak. "It's a printer that people can use at home, at work, and in between."





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or even and . Call or write for more

information about **PrintMaster™**!

• Most of the above graphics from PrintMaster and Art Gallery I.

Printers supported on the IBM PC version:

Blue Chip; Citizen MSP-10, and MSP-20; C-Itoh Prowriter 8510, and Prowriter Jr.; Data Products SPG 8010-2, 8012, 8021, 8022, 8051, 8052, 8071 and 8072; EPSON FX, JX, LX, RX, LO-1500, and MX with Grafrax; HP Think Jet; IBM Color Dot Matrix, Compact Thermal, Graphics Printer and ProPrinter; IDS Prism; Mannesmann Tally MT 85 and 86; NEC P2/P3 Prowriter, 8023A and 8027; MPI Sprinter; Okidata 82A/83A with Okigraph 1, 84 (Step II), 92, 93, 182, 183, 192, 193, and Okimate 10 and 20; Panasonic KX-P 1090, 1091, 1092, and EP-1505; Star Gemini 10 and 15; Tandy CGP 220, DMP 105, 130, 200, 400 420, 430, 500, 2100, 2100P and 2200; TI 855; Toshiba 1340, 1350, 1351 and P351; Smith Corona D300.

Printers supported on the Apple version:

Apple Imagewriter and Scribe; C-Itoh Prowriter 8510; EPSON FX-80/100, RX-80/100, and MX-80 with Grafrax; Okidata 92 and 93; Star Gemini 10 and 15.

Printers supported on the Atari version:

C-Itoh Prowriter 8510; EPSON FX, RX, LO-1500, and MX with Grafrax; IBM Graphics Printer; Okidata 82A/83A with Okigraph 1, 84 (Step II), 92 and 93; Star Gemini 10 and 15; Toshiba 1340, 1350, 1351, and P351.

Printers supported on the Commodore version:

C-Itoh Prowriter 8510 and Prowriter Jr.; Commodore VIC-1525 and MPS-801; EPSON FX, RX, and MX with Grafrax; Okidata 92, 93, 192, and Okimate 10; Star Gemini 10 and 15.

Printers supported on the CP/M version:

C-Itoh Prowriter 8510 and Prowriter Jr.; EPSON FX, RX, LO-1500, and MX with Grafrax; IBM Graphics Printer; Okidata 82A/83A with Okigraph 1, 92 and 93; Star Gemini 10 and 15; Tandy DMP 105, 130, 430, 2100, 2100P, and 2200; Toshiba 1340, 1350, 1351, and P351.



SOFTWARE GUIDE

Welcome to FAMILY COMPUTING's Software Guide, the most comprehensive listing available of two dozen of the newest, most noteworthy, and/or best programs on the market. Our reviewers include families from all over the country who have judged the software according to the following criteria: long-term benefits and applications, adaptability, and advantages of using a computer for a given task. Programs have been evaluated and rated for their performance in each of the categories listed below. More detailed reviews follow the chart. Unless otherwise noted, all programs are in disk format; minimum memory requirements are 48K for Apple II series, 48K for Atari, 128K for IBM PC/PCjr or compatibles, and 128K for Macintosh. Please note that "Atari" alone refers to the 800/XL/XE series, while "Atari ST" denotes the 520ST or 1040ST.

Here's a rundown of the rating categories and what they mean: **O** = Overall performance, given the limitations and capacities of the particular computer for which the software is intended. **D** = Documentation, or the instructions and literature that accompany a program. **EH** = Error-handling, the software's capacity to accommodate errors made by the user—an especially important consideration with software for younger users. **PS** = Play system, in the games reviews, the quality of the game design and the game's playability. **GQ** = Graphics quality, also evaluated in light of each particular brand's graphics capabilities. **EU** = Ease of use after the initial learning period, which varies from computer to computer. **V** = Value for money, or how the software measures up to its price.

HOME BUSINESS & PRODUCTIVITY

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings					
				O	D	EH	GQ	EU	V
THE ART STUDIO Spectrum HoloByte, Inc. 1050 Walnut, Suite 325 Boulder, CO 80302 (303) 443-0191 \$50 ©1985	An icon-based (picture commands) high-resolution drawing program that works as well with the keyboard as with the mouse for accurate control. Complete, but complex, so read the manual first. —ELTGROTH	IBM PC/PCjr.* Color graphics adapter. Graphics tablet, mouse optional.	90-day warranty. \$7.50 thereafter. User makes backup.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	D ★ ★	★ ★ ★
HABADEX 2.0 Haba/Arrays, Inc. 6711 Valjean Ave. Van Nuys, CA 91406 (818) 901-8828 \$100 ©1985	For people on the go, this dedicated data base can serve as your address book, appointment calendar, and on-line communications program. Also does mail-merge. Especially easy. —AKER	Macintosh. Modem required for automatic phone dialing.	30-day warranty. \$10 thereafter or for backup.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E ★ ★	★ ★ ★
IT FIGURES SimplSoft Products, Inc. 5330 Sterling Drive Boulder, CO 80301 (303) 444-8771 \$40 ©1986	Somewhere between an electronic calculator and a full-fledged spreadsheet, <i>It Figures</i> can help you with personal finance questions such as, "What is your net worth?" Easy to use. + —MORRIS	IBM PC/PCjr.*	30-day warranty. \$3 thereafter. User makes backup.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	N/A	E ★ ★ ★	★ ★ ★
SENSIBLE GRAMMAR Sensible Software, Inc. 210 S. Woodward, #229 Birmingham, MI 48011 (313) 258-5566 \$100 ©1985	Checks for errors in punctuation as well as grammar in your word-processed documents. But it can only guide; you still have to know the correct rules of grammar. May not be practical for all. + —MORGENSTERN	128K Apple IIe/IIc. Mouse optional.	90-day warranty. \$10 thereafter. Free backup available.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	A ★ ★	★ ★ ★
SIMPLY PERFECT LJK, Inc. 7852 Big Bend Blvd. St. Louis, MO 63119 (314) 962-1855 \$170 ©1984	In <i>Simply Perfect</i> , a word processor and spelling checker are combined with a data base that has math functions. A good package that works well for both home and small business use, but it could be easier to work with. —SOLOMON	128K Apple IIe/IIc.	90-day warranty. \$10 thereafter. User makes backup.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	A ★ ★	★ ★ ★
UNICALC SPREADSHEET Lattice, Inc. 22 W. 600 Butterfield Road Glen Ellyn, IL 60137 (312) 858-7950 \$80 ©1985	Ease of use characterizes this spreadsheet; even though the manual refers to IBM-PC keys, I learned it very quickly on an Amiga. Does not use the Amiga's mouse for cursor control. Useful for financial decisions. —POWELL	Reviewed on 512K Amiga. Also for 256K IBM PC/PCjr.*	90-day warranty. User makes backup. 30-day money-back guarantee.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	E ★ ★	★ ★ ★

RATINGS KEY O Overall performance; D Documentation; EH Error-handling; GQ Graphics quality; EU Ease of use; V Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; + Longer review follows chart.

*Titles listed for the IBM PC/PCjr will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

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Cloud	119.95	ASC II Express	72.50	PFS: Plan	69.95
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Cornerstone	259.95	Bag of Tricks 2	28.00	PFS: Graph	69.95
Crossstalk	94.95	Bank Street Filer	38.95	PFS: First Success	126.00
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Deadline Manager	104.95	Bank Street Writer	38.95	Pinpoint	39.95
Dollars & Sense	104.95	Bank Street Speller	38.95	Prince	48.95
Easy	97.50	Bard's Tale	28.50	Printographer	23.95
Einstein Writer	118.95	Beagle Bag	14.95	Print Shop	26.95
Electric Disk	239.95	Beagle Basic	17.95	Prt Shp Gr. #1, or 3	13.95
Fontrix 1.5	84.95	Beagle Graphics	29.95	Print Shop Comp.	21.95
Fntpk3 thru 13 ea.	13.00	Beneath Apple DOS	13.95	Probster	
Framework II	369.95	Big U	16.95	Pronto DOS	14.95
Gamecard III	39.95	Bookends	64.95	Prof. tour golf	25.95
Gato	23.69	Captain Goodnight	19.95	Quicken	51.95
In House Accountant	119.95	Carmen Sandiego	22.45	Report Card	32.95
Jet	32.95	Chmpshp Ld. Runner	19.45	Rescue/Fractalus	
KnowledgeMan 2.0	319.95	Char'n Graph Tbx	23.95	Reportworks	64.95
Lotus	CALL	Computer Quarterback	27.95	Rescue Raiders	24.95
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Micro Cookbook	25.95	Crypt of Medea	21.95	Sensible Grammar	59.95
Microsoft Chart 2.0	299.95	DiskQuick	14.95	Sensible Speller	64.95
Word	239.95	Dollars & Sense	66.60	Silicon Salad	12.65
Windows	69.95	DOS Boss	11.95	Skyfox	24.50
Morton Utilities	55.95	Double-Take	17.95	Spellworks	29.95
PFS: Access	59.95	Editor	23.50	Spitfire Simulator	24.75
PFS: Files	82.50	Essential Data Dup	41.95	Sticky Bear ABC	23.75
PFS: First Success	229.95	Extra K	19.95	Sticky Bounce	23.75
PFS: Graph	82.50	Fantavision	26.95	Car Builder	23.75
PFS: Plan	82.50	Fat Cat	17.95	Math	23.75
PFS: Proof	59.95	Flex Type	14.95	Numbers	23.75
PFS: Report	82.50	Fontrix 1.5	53.25	Opposites	23.75
PFS: Write	82.50	Fntpk3 thru 13 ea.	13.00	Reading	23.75
Print Shop	36.95	Font Works	34.95	Spellgrabber	23.75
Print Shop Gr. #1	22.95	Forecast	36.00	Townbuilder	23.75
Print Shop Refill	13.95	Frame-Up	14.95	Typing	23.75
R-Base 5000	339.95	Gato	20.45	Summer Games I or II	22.45
Reflex	56.95	G I Joe	19.95	SuperCalc 3A	109.95
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Report Card	33.00	Graphics Expander	21.95	Think Tank	88.85
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Sidekick protected	29.95	GPLE	24.95	Time is Money	57.45
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Sideways Ver. #3	48.95	Impossible Mission	23.50	Transylvania	19.50
Speedkey	104.95	I.O. Silver	14.95	Triple-Dump	18.95
SuperCalc 3	239.95	Jeeves	29.95	Turbo Database Tbx	27.95
Superkey	35.50	Karateka	19.45	Turbo Pascal 3.0	34.95
Sprkly/Sidek. Combo	67.95	Knight of Diamonds	19.50	Turbo Tutor	20.50
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Time Is Money	76.89	King's Quest I or II	29.95	Ultima IV	33.25
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Turbo Lighting	56.95	List Handler	39.95	Utility City	15.25
Turbo Pascal 3.0	36.50	Locksmith	56.95	Versaform	43.45
Turbo Pascal 8087	59.95	Mngng Yr Money	102.00	Video Toolbox	23.95
Turbo Prolog	69.95	Mathmaze	27.95	Visible 6502	31.75
Turbo Tutor	24.95	Megaworks	64.95	Wilderness	38.95
Ultima III	34.95	Merlin	33.69	Winter Games	21.45
Visibyte 8088	49.95	Merlin Pro	54.95	Wizardry	26.50
Volkswriter Dlx #3	159.95	Merlin Combo	63.95	Wizard's Toolbox	23.95
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Will Writer	31.95	Millionaire	22.50	Word Handler	39.95
Wizardry	38.95	Minipix	14.69	Word Perfect	125.95
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Wordstar	214.95	MouseWrite	71.95	Write Choice	26.45

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Crossword Magic	30.00	F-15 Strike Eagle	19.45
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SOFTWARE GUIDE

EDUCATION/FUN LEARNING

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings					
				O	D	EH	GQ	EU	V
CODES AND CYPHERS Weekly Reader Family Software 245 Long Hill Road Middletown, CT 06457 (203) 638-2400 \$40 ©1985	Young cloak and dagger enthusiasts (ages 8+) will enjoy sending coded messages between friends, while the code-cracking puzzles should appeal to anyone who enjoys word games. —MORGENSTERN	Apple.	90-day warranty. \$10 for backup.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A ★ ★ ★	★ ★ ★
DONALD DUCK'S PLAYGROUND Sierra On-Line, Inc. Sierra On-Line Building Coarsegold, CA 93614 (209) 683-6858 \$30 ©1984	Children will need quick thinking, an understanding of how money works, and skill with a joystick to help Disney's duck build a playground for his three nephews. We were impressed. For ages 7-11.† —SUMMERS	Reviewed on 64K Apple. Also for C 64/128. Joystick. Planned for IBM PC/PCjr.* Color monitor recommended.	90-day warranty. \$5 thereafter.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A ★ ★ ★	★ ★ ★
FASTREAD Achievement House 103 Great Plain Road Danbury, CT 06811 (203) 748-0277 \$60 ©1985	Increases reading speed using a variety of techniques to help you absorb information more quickly. The progressively more difficult lessons work best for the highly motivated. For ages 12+. —SUMMERS	IBM PC.*	90-day warranty. \$5 for backup. 30-day money-back guarantee.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	E	★ ★
FIRST STEPS TO READING Grolier Electronic Publishing Sherman Turnpike Danbury, CT 06816 (800) 858-8858 \$30 ©1985	Preschoolers match pictures with letters or vice versa to practice basic phonics skills. Five of the six games test recognition of beginning sounds (the sixth is ending sounds), but it's more lesson than game; thus you'll need to provide your child with assistance. —SUMMERS	Reviewed on 64K Apple. Also for C 64/128. Joystick optional.	90-day warranty. \$10 thereafter. 30-day preview.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★ ★ ★
THE (NEW) OREGON TRAIL MECC 3490 Lexington Ave. N. St. Paul, MN 55126 (612) 481-3500 \$30 ©1985	An entertaining opportunity to learn about the westward settlement of the American frontier in the 1840s. Managing scarce resources in a hostile environment is your key to success. —MORGENSTERN	64K Apple. Color monitor recommended.	Unlimited warranty.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
PROGRAMMERS' BASIC TOOLKIT Epyx, Inc. 1043 Kiel Court Sunnyvale, CA 94089 (408) 745-0700 \$45 ©1985	Toolkit makes it easy to get complex assembly-language-quality graphics while programming in BASIC. It offers over a hundred new BASIC commands for both veteran coders and programming rookies.† —LATIMER	C 64/128. Joystick. Color monitor recommended.	90-day warranty. \$5 thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
TYPING IS A BALL, CHARLIE BROWN Random House Software 201 E. 50th St. New York, NY 10022 (212) 751-2600 \$20-\$30 ©1985	This graphically appealing program is better as a sidelight to more formal typing training because it does not include enough actual typing instructions. Features the Peanuts gang and three different games for typing practice. —MORGENSTERN	Reviewed on 64K Apple. Also for C 64/128. Color monitor recommended.	90-day warranty. \$5 for 9 months thereafter. \$5 for backup.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
WRITER'S HELPER Conduit The University of Iowa, Oakdale Campus Iowa City, IA 52242 (319) 353-5789 \$120 ©1985	Choose from a collection of 22 programs designed "to help writers find and creatively organize ideas, put those ideas in writing, and evaluate what they have written." A valuable tool for ages 12 to adult.† —MORRIS	Reviewed on 64K Apple IIe/IIc. 80-column card. Also for 256K IBM PC/PCjr.*	30-day warranty. \$10 thereafter. 30-day money-back guarantee. One-year product support.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	A	★ ★ ★

RATINGS KEY O Overall performance; D Documentation; EH Error-handling; GQ Graphics quality; EU Ease of use; V Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart.

*Titles listed for the IBM PC/PCjr will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

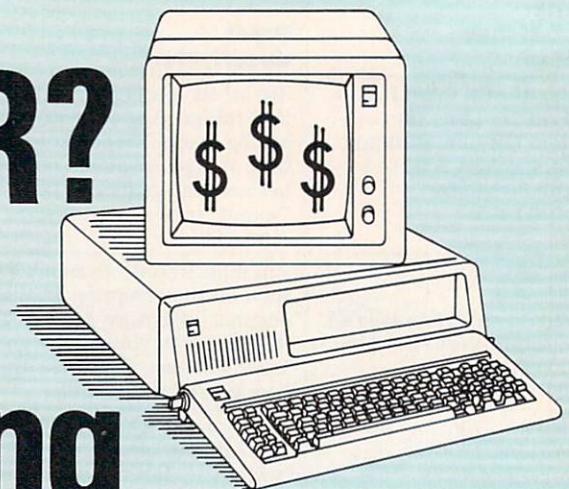
ENTERTAINMENT REVIEWS BY JAMES DELSON

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings					
				O	D	PS	GQ	EU	V
THE BLACK CAULDRON Sierra On-Line, Inc. Sierra On-Line Building Coarsegold, CA 93614 (209) 683-6858 \$40 ©1985	Six arcade sequences enliven this role-playing adventure based on the recent Disney animated film. You get extended play life because the game can be "solved" in a variety of ways. Ages 12+.	Reviewed on IBM PC/PCjr.* Also for 128K Apple IIe/IIc, Atari 520ST. Joystick or mouse optional. Color monitor recommended.	90-day warranty. \$5 thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A ★ ★	★ ★ ★
HACKER Activision 2350 Bayshore Frontage Rd. Mountain View, CA 94043 (415) 960-0410 \$25-\$45 ©1985	You're in trouble as soon as you turn on the computer in this original adventure game that has no instructions. The goal here is to save the world, but how you do it is a mystery!	Reviewed on IBM PC/PCjr.* Also for Amiga, 64K Apple, 64K Atari, Atari 520ST, C 64/128, Macintosh. Joystick or mouse.	90-day warranty. \$7.50 thereafter or for backup.	★ ★ ★	N/A ★ ★	★ ★ ★	★ ★ ★	D ★ ★	★ ★ ★
KORONIS RIFT Epyx, Inc. 1043 Kiel Court Sunnyvale, CA 94089 (408) 745-0700 \$40 ©1985	You fly a space-salvage ship in this strategy/arcade game for one. If you don't improve the ship, you'll lose to your ever-more dangerous enemy. First-rate graphics. For ages 8+.	Reviewed on Atari. Also for 64K Apple, C 64/128. Joystick. Color monitor recommended.	90-day warranty. \$5 thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A ★ ★	★ ★ ★
LORDS OF CONQUEST Electronic Arts 1820 Gateway Drive San Mateo, CA 94404 (415) 571-7171 \$33 ©1986	You'll need to combine trading, negotiating, and combat skills to play this excellent political/military strategy game. With some construction set capabilities, too. For novices and experts.†	C 64/128. Joystick. Planned for Apple and Atari.	90-day warranty. \$7.50 thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A ★ ★	★ ★ ★
PHANTASIE II Strategic Simulations, Inc. 1046 N. Rengstorff Ave. Mountain View, CA 94043 (415) 964-1200 \$40 ©1986	As a sequel to last year's best role-playing adventure, <i>Phantasie II</i> is just as involving, just as exciting, and just as much fun. Plan on spending a few hundred hours exploring a new domain.†	Reviewed on Apple. Also for C 64/128. Joystick optional.	30-day warranty. \$10 thereafter or for backup.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A ★ ★	★ ★ ★
PSI 5 TRADING CO. Accolade, Inc. 20833 Stevens Creek Blvd. Cupertino, CA 95014 (408) 446-5757 \$30-\$35 ©1986	A novel space adventure that puts you in command of an interstellar trading vessel. Choose a crew from humans, aliens, and robots; then fight off pirates and fulfill your contracts. For ages 12+.	Reviewed on 64K Apple. Also for C 64/128. Joystick optional. Planned for IBM PC/PCjr.	90-day warranty. \$6 thereafter. \$10 for backup.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	D ★ ★	★ ★ ★
SPELLBREAKER Infocom 125 Cambridge Park Drive Cambridge, MA 02138 (617) 492-6000 \$45-\$50 ©1985	The final game in Infocom's "Enchanter" trilogy is a knockout text adventure for experts. Use your wits, a spell book, and discovered objects to figure out why magic is failing in this fantasy world.	Reviewed on Apple. Also for Amiga, Atari, Atari 520ST, C 64/128, IBM PC/PCjr,* Macintosh.	90-day warranty. \$5 thereafter. User makes backup (Apple, Amiga, IBM, Mac).	★ ★ ★	★ ★ ★	★ ★ ★	N/A ★	D ★	★ ★ ★
SUPER BOULDER DASH Electronic Arts (See above for address and phone) \$23-\$30 ©1986	If you like to solve tough puzzles while using split-second timing to survive, you'll enjoy this sequel to <i>Boulder Dash</i> , a classic strategy/arcade game. Great fun for all levels.†	Reviewed on C 64/128. Also for 64K Apple, Atari. Joystick. Planned for IBM PC/PCjr.*	90-day warranty. \$7.50 thereafter.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A ★ ★	★ ★ ★
TOURNAMENT BRIDGE Random House Software 201 E. 50th St. New York, NY 10022 (212) 751-2600 \$50 ©1985	This phenomenal bridge-playing program is also a great teaching tool. If you have the game's basics down, you'll enjoy playing as well as improving your abilities. An instant classic.†	IBM PC/PCjr.* Color graphics adapter. Planned for Apple.	90-day warranty. \$5 for 9 months thereafter. \$5 for backup.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E ★	★ ★ ★
U.S.A.A.F. Strategic Simulations, Inc. (See above for address and phone) \$60 ©1986	A difficult but rewarding strategy and tactics game that simulates the bombing raids of the U.S. Army Air Force over Germany in World War II. Highly flexible. Ages 12+.	Reviewed on C 64/128. Also for Apple, Atari.	30-day warranty. \$10 thereafter or for backup.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	D ★	★ ★ ★

RATINGS KEY O Overall performance: D Documentation: PS Play system: GQ Graphics quality: EU Ease of use: V Value for money: ★ Poor: ★★ Average: ★★★ Good:
★★★★ Excellent: N/A Not applicable: E Easy: A Average: D Difficult: + Longer review follows chart.

*Titles listed for the IBM PC/PCjr will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

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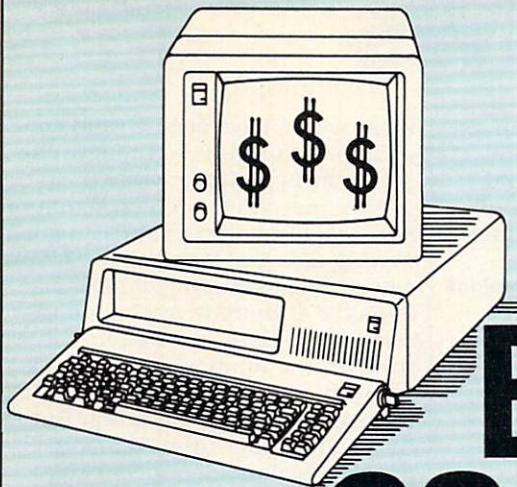
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SOFTWARE REVIEWS

On the following pages, you'll find in-depth reviews of some of the programs listed in the Software Guide. Refer back to the Guide on page 82 for information such as backup policies and addresses of software publishers.

HOME BUSINESS & PRODUCTIVITY

It Figures

HARDWARE REQUIREMENTS: IBM PC/PCjr.
PUBLISHER: SimplSoft Products, Inc.
PRICE: \$40

What is your net worth? What will the mortgage payments be if you refinance your home? If you increase your deductions by \$500, what effect will that have on your income tax?

Those are just a few of the uses for *It Figures*, software that falls somewhere between a hand-held calculator and a full-fledged spreadsheet. *It Figures* is a high-powered "electronic worksheet" that solves mathematical questions using either ready-made formulas included with the package or formulas of your own creation. For business people, *It Figures* may be used for such functions as break-even analysis, payroll calculations, profit margins and mark-ups, and accounts receivable. If you're a math or engineering student, you'll appreciate the built-in formulas for solving problems, such as linear regression and factorials.

It's relatively easy to make up your own formulas and build up a library of worksheets. If you enjoy boating, for example, you can set up a formula to figure drift due to current; if you're in high school, you can create formulas to solve geometry and science homework problems. Since the program includes sophisticated mathematical functions (such as sine, cosine, logarithms, and square roots), the experienced user can create equations for even extremely complex problems.

I found only one drawback worth mentioning. The documentation I looked at is devoted almost entirely to procedures for creating your own formulas and worksheets. The availability of all the preprogrammed formulas is not mentioned until halfway through the manual. (Note: The publisher advises that a new manual will be out soon.) How much more logical it would have been to introduce the user to the various

resident formulas, and only then explain in detail how to create new ones! Such documentation would have earned an excellent rating to match the overall high performance and value of the software itself.

—TONY MORRIS

Sensible Grammar

HARDWARE REQUIREMENTS: 128K Apple IIe/IIc.
PUBLISHER: Sensible Software, Inc.
PRICE: \$100

Programs that check for spelling errors have become extremely popular. They're not perfect by any means (if you use "to" when you mean "two," there's no help), but they do identify many misspelled words, and you can easily ignore the "false alarms."

Checking for errors in grammar and punctuation is a very different challenge, though. The authors of *Sensible Grammar* should be applauded for their ambition in tackling the job at all, and complimented on the level of success they have achieved. However, as a practical tool to improve your writing, it's not always helpful.

Punctuation follows fairly rigid rules, and the program is quite successful in picking up typographical mistakes and errors of judgment in this area. Place a comma outside a final quotation mark, for example, or forget to capitalize the first letter in a new sentence, and the program calls the problem to your attention.

English grammar is much trickier than punctuation, and the strategy employed to check this area is only sometimes successful. Working like a spelling checker, the program compares the words in your document against a list of over 1,000 commonly misused phrases (you can add phrases of your own). Each time it finds a match, it stops to let you know. However, that doesn't mean that your use of the word or phrase is wrong, nor does it mean that words or phrases it lets pass are necessarily correct.

For example, this sentence: "As long as the car moves forward smoothly, we know the tires aren't flat."

Sensible Grammar found two problems here. "As long as" was dubbed an "informal phrase," and "while" and "since" were recommended as replacements. "Forward" was labeled as a "vague phrase," and "send" was suggested instead.

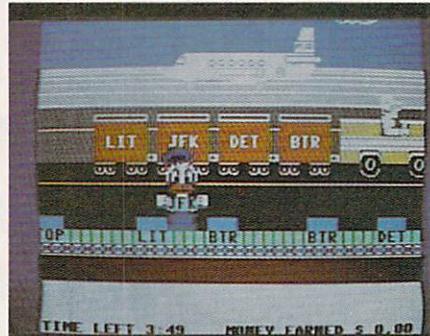
You can see what's happening here: in another context, each of

these would have been a valid correction. As used here, though, the grammar is perfectly correct.

If you need help with punctuation, *Sensible Grammar* is surely a good writing aid. And if you already have a good understanding of grammar, *Sensible Grammar* will help find certain mistakes; yet wading through the number of correct usages which are flagged as potentially incorrect is time consuming. But for those who suffer from common grammatical problems, *Sensible Grammar* simply aren't, er, isn't always sensible enough to help.

—STEVE MORGENTERN

EDUCATION/FUN LEARNING



Donald Duck's Playground

HARDWARE REQUIREMENTS: 64K Apple, C 64/128.
PUBLISHER: Sierra On-Line, Inc.
PRICE: \$30
PUBLISHER'S SUGGESTED AGES: 7-11

Donald Duck's Playground packs a lot of punch into a single package. Your goal? To help Donald build a playground for his nephews, Huey, Dewey, and Louie. But first you need to get a job to earn some cash so you can buy playground toys. Each of four jobs is a different, fast-paced game that teaches children to recognize letter groups, handle money, make change, and match various shapes with colors and letters. You'll need joystick expertise and quick thinking.

Ten-year-old Betsy and I started work at McDuck Airlines. Taking luggage from a moving conveyor and matching authentic three-letter airport codes with similarly marked baggage carts wasn't as easy as it looked. After three minutes of play, we collected a dime, a nickel, and four pennies, and decided to try our luck elsewhere. The supermarket and toy store jobs turned out to be

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games for matching shapes and colors, and we earned 25 cents more.

Our job at the Amquack Railroad required logic, not hand-eye skills, but Betsy set the on-screen timer for 10 minutes this time just to be safe. We earned three quarters by quickly figuring out where a train is supposed to be going to deliver its load, and then routing it correctly. After all four games, we set off to spend our total fortune of \$1.19.

At the junk store, we bought a swing for a penny and a slide for 10 cents, using the joystick to select the correct coins and make change. Prices shoot up when you play the game at more advanced levels. Earning money gets harder, too, as fruits fly faster and trains come by more frequently.

I was impressed with how many learning activities can be packed into one program. Betsy was impressed with how much fun she had, and we were both impressed by the wonderful graphics. Most of the activities reinforce financial and thinking skills children usually learn by the time they're seven years old, but the coordination required to play is more in line with the capabilities of children older than seven.

—TAN A. SUMMERS

Programmers' BASIC Toolkit

HARDWARE REQUIREMENTS: C 64/128.

PUBLISHER: Epyx

PRICE: \$45

PUBLISHER'S SUGGESTED AGES: All

Writing graphics programs in 6502 assembly language is not my idea of a light, Sunday-afternoon computing picnic. While I enjoy the colorful, fast results of assembly language programming, I'm not too happy about the time it takes. When I want to do some Sunday afternoon programming without a lot of hard work, I insert the *Programmers' BASIC Toolkit* into my disk drive. With the Toolkit's custom commands, it's easy to get assembly language quality graphics using BASIC.

Loading the *Programmers' BASIC Toolkit* is quick because it includes Vorpal Fast Loader software. In about five seconds, you have over a hundred new BASIC commands and eight pre-assigned function keys at your fingertips.

Here are some of the very useful new commands: BORDER eliminates the messy pokes you normally use to change the border's color, while BACKGROUND does the same for the

text screen's background color. CIRCLE not only makes it simple to create on-screen circles, but any regular polygon as well.

Included on the Toolkit disk are a sprite editor, a background/font editor, and several demo programs that show some of the tricks that can be done with the Toolkit's BASIC. Whether you're a veteran coder or a programming rookie, you'll enjoy *Programmers' BASIC Toolkit*. If you already know how to program in BASIC, you can give your programs that "assembly language" look without days of work. If you are just learning how to program, the Toolkit will make it easier for you to exploit the extensive graphics and sound features of the C 64.

—JOEY LATIMER

Writer's Helper

HARDWARE REQUIREMENTS: Apple IIe/IIc, IBM PC/PCjr.

PUBLISHER: Conduit

PRICE: \$120

PUBLISHER'S SUGGESTED AGES: 12+

"I can't think of anything to write for English and the topic is due tomorrow!" Sound familiar? Well, three of the 22 programs that make up the *Writer's Helper* collection are designed specifically to help the budding writer find a topic. One program uses brainstorming, another uses idea lists, and a third is a set of built-in questions. Can't think of anything to say about the topic? Then try "crazy contrasts" such as "How does your subject compare to an abandoned building?"

After a subject has been found and some ideas generated, five programs help to organize your thoughts. One program forces information into a set of headings and subheadings (a "tree"). Another program collects ideas on both sides of an argument, and then helps you select the most important material.

The remaining programs in *Writer's Helper* assist in the process of actually writing. They help check for

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SOFTWARE REVIEWS

homonyms ("there" and "they're" for example), sexist language, correct use of the verb "to be," and common usage errors (like "affect" versus "effect"). One program lists your most frequently used words, and another rates your writing on overall readability.

It would take several hours to work with all the programs in this package on any particular writing assignment, but it's easy to choose just those programs which will be most helpful on a specific project. We found this flexibility a welcome feature. Best of all, the skills learned while using *Writer's Helper* can be carried away and used anytime, with or without a computer.

Note a couple of small drawbacks. The cost is relatively high. Moreover, the software was originally developed for classroom use; thus some of the programs assume that a parent is available to replace the teacher's participation in the writing process.

But, as my daughter Anne noted, "The documentation is great; it's well organized and covers all areas of writing." Matt, my youngest son, was especially pleased that the software accepts material written with most Apple word processors.

For students from junior high school through college, *Writer's Helper* is a great tool that does what it says it does.

—TONY MORRIS

ENTERTAINMENT



Lords of Conquest

HARDWARE REQUIREMENTS: C 64/128.
PUBLISHER: Electronic Arts
PRICE: \$33
CRITIC'S SUGGESTED AGES: 10+

All but unknown two years ago, the political/military simulation is on the cutting edge of game design. In programs such as *Balance of Power* and *Colonial Conquest*, key elements of several successful game genres combine to create the most

sophisticated multiplayer entertainments around.

Lords of Conquest, the newest of these simulations, also mixes resource management, political negotiation, and strategic and tactical planning with a flexible, menu-driven play system. The object is to conquer a real or fictitious world or land mass, choosing from 20 different on-disk maps or building your own with the game's construction set. Using "force points"—based on the combined power of your territories and available support from horses, weapons, boats, and cities—you take and try to hold key locations.

Although you can conquer territories through combat, a negotiation phase (in three- or four-player games only) allows the trading of goods and the forging of political alliances. Thus playing with people (as well as the computer) can be as big a part of the game as you want.

With more options than can be listed here, *Lords of Conquest* offers almost unlimited numbers of games from within its play system. It's as exciting for one player as it is for a quartet, and it's quick, too. An average game takes less than two hours. Highly recommended.

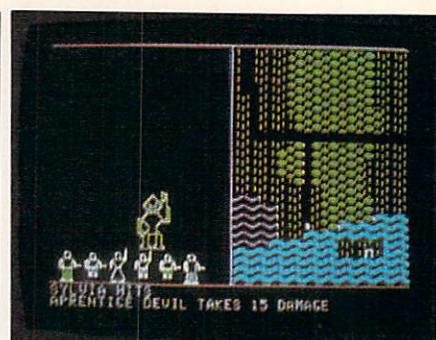
Phantasie II

HARDWARE REQUIREMENTS: Apple, C 64/128.
PUBLISHER: Strategic Simulations, Inc.
PRICE: \$40
CRITIC'S SUGGESTED AGES: 12+

Fans of role-playing adventures will be happy that last year's hit, *Phantasie*, now has a sequel that's equal to the original. Gamers will be just as involved in the adventuring, just as excited by exploring the countryside and the dungeons, and just as eager to improve their characters as they were in the first scenario.

Phantasie's excellent combat system has been slightly improved by the addition of a new skill, rock throwing (ideal for picking off monsters in the rear ranks). The storyline is more mysterious; even though clues are offered, there is little else to pin down exactly how you're to accomplish your mission. And there are some new terrain features, such as molten lava and swirling mist. But overall, *Phantasie II* is designed along the same lines as the first adventure.

Although it is a sequel, you're not required to use characters from the



previous game. Your character is designed to grow at a slow pace unless you find shortcuts (hint: I always teleport to advanced cities as soon as I get Spell 54 in order to build my character's attributes more quickly). Playtesters agreed that this game is accessible to novices and experts alike. *Phantasie II* is a must for role players who want to spend a few hundred hours "long ago and far away."

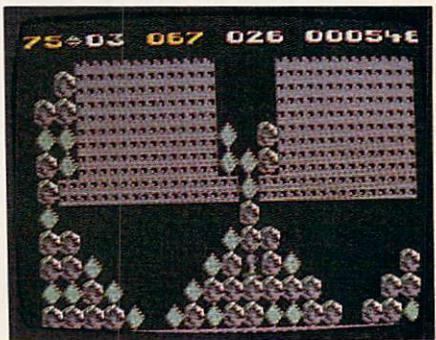
Super Boulder Dash

HARDWARE REQUIREMENTS: 64K Apple, Atari, C 64/128.
PUBLISHER: Electronic Arts
PRICE: \$23-\$30
CRITIC'S SUGGESTED AGES: 8+

This was a month for playtesting excellent sequels. *Super Boulder Dash* is the successor to *Boulder Dash*—one of the first (and still one of the best) strategy/arcade games. Both games are joystick-operated, multi-screen challenges of timing, hand-eye coordination, and strategic planning.

Don't worry if you've never played the original because, as a bonus, it's included as side one of the disk. Novices are urged to complete side one before trying the new version, since the difficulty level of even the easiest screen requires an hour or more to crack.

Practice is essential. Remember, in this type of game there's always a



proper way to get through a screen. Generally speaking it will involve using elements that initially appear dangerous or unsolvable.

We couldn't get some playtesters away from the game, even for snacks. Everyone agreed that *Super Boulder Dash* is one of the best strategy/arcade games for all levels of play.

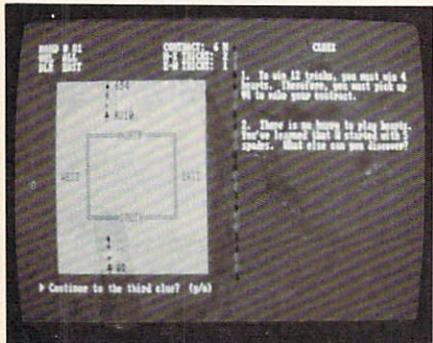
Tournament Bridge

HARDWARE REQUIREMENTS: IBM PC/PCjr.

PUBLISHER: Random House Software

PRICE: \$50

CRITIC'S SUGGESTED AGES: 12+



While it's fairly easy to learn the basic rules of bidding and playing bridge, it has always been difficult to grasp the subtleties of this greatest of all card games. Many bridge players have been stuck with a Catch-22: You're not welcome in a foursome unless you're experienced, but you can't get the experience unless you play regularly. Until now.

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Each hand can be played and replayed. There are tips on such bridge conventions as finessing, ruffing, uppercutting, holding up, safeties, dummy reversals, dropping, ducking, squeezing, and a host of pointers. I've played bridge for 25 years, and I've never learned so much about the game in such a short time. *Tournament Bridge* is an excellent opponent and teaching tool; you couldn't ask for better.

—REVIEW BY JAMES DELSON

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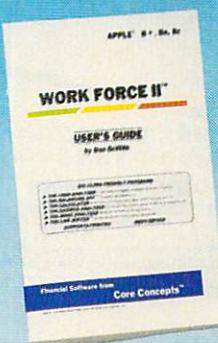
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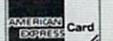
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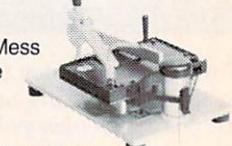
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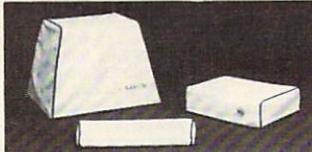
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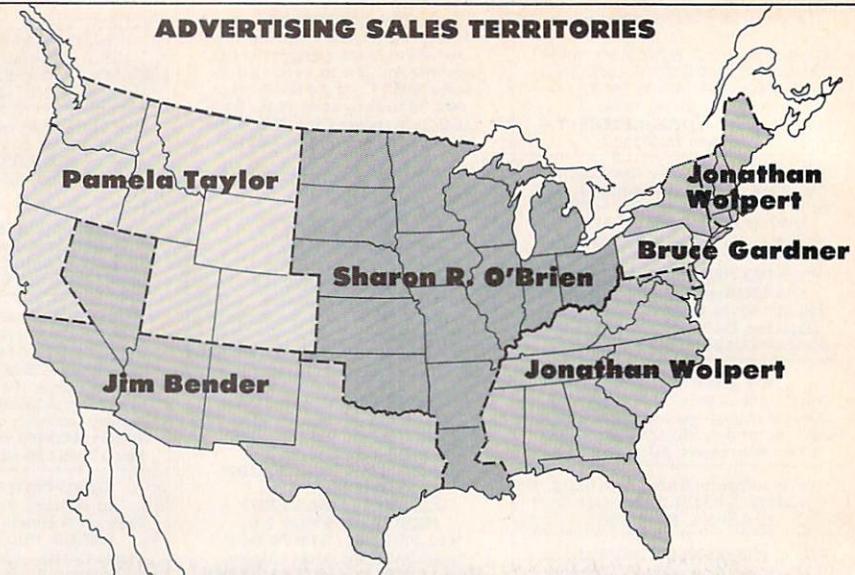
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7	8	9	10	11	12
13	14	15	16	17	18
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31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48
49	50	51	52	53	54
55	56	57	58	59	60
61	62	63	64	65	66
67	68	69	70	71	72
73	74	75	76	77	78
79	80	81	82	83	84
85	86	87	88	89	90
91	92	93	94	95	96
97	98	99	100	101	102
103	104	105	106	107	108
109	110	111	112	113	114
115	116	117	118	119	120
121	122	123	124	125	126
127	128	129	130	131	132
133	134	135	136	137	138

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